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Birthday honours go to Dorey and Ellis

Peter Ellis

Peter Dorey

EXPORT achievements by the computer industry were recognised in the Queen's Birthday Honours list by awards to Peter Dorey of Ferranti and Peter Ellis of ICL.

Dorey, who is appointed a CBE, is a director of Ferranti and managing director of Ferranti Computer Systems Ltd, a recently created grouping taking in all the company's computer and microprocessor activities. He was responsible for building up Ferranti's business in the military field and has also been closely involved in the joint venture with the Brazilian government and industry to build Argus computers in Brazil.

Peter Ellis, who is awarded the OBE, is ICL's director of worldwide marketing. He joined Powers-Samas in 1951 and when that company merged with British Tabulator he formed the first programming group. He played a leading part in ICT in 1900 product planning and when ICL was formed in 1968 he became director of accounts, planning and commercial areas. He took over his marketing role in 1970.

Other honours include knighthoods for Robert Telford, managing director of GEC-Marconi Electronics, and for Amos Chilver, vice-chancellor of Cranfield Institute of Technology.

The MBE has gone to J. G. Walker, a personnel officer at IBM's Greenock plant, and the BEM has been awarded to H. D. Steven, a technical officer with the maintenance division in Edinburgh telephone area.

NEWS IN BRIEF

Bar on GEC strikers

A HIGH COURT injunction bars GEC's striking operators from all the company's Coventry works, as the operators' pay dispute remains unresolved. GEC took legal action after operators staged a sit-in at the engineers' section of the Stoke, Coventry plant on May 23 and later occupied the computer room.

The strike arose on February 24, because the operators are unhappy with the pay rises offered by the company and it became an official ASTMS matter on March 20.

London is new HQ

THE US-BASED manufacturer of IBM 3350 replacement disc drives, Storage Technology, has, as expected, opened a London office (CW February 16) which becomes the firm's European headquarters. Storage Technology also manufactures main store extensions for IBM 370 computers.

Edutronics switch

THE assets of Edutronics Systems International, the US computer training materials manufacturer, have been acquired by McGraw-Hill, the publishers, for an undisclosed amount.

Thirtieth Argus

A MONITORING system based on a 112K word Ferranti Argus 700S processor will evaluate the performance of a 500 Megawatt coal fired boiler and turbine unit at Fiddler's Ferry Powar Station in the CEGB's North Western Region. Worth over £200,000, this brings the total of Argus systems in power generation applications to 30.

'Computers could halt government'

THE vulnerability of large government computer centres to disruption which could bring the business of various departments to a halt, is highlighted in a report prepared by senior civil servants. Strike action is among the dangers mentioned by the report.

However, trade unions representing civil servants say that although computer centres are useful targets for effective action, such action could not have the disastrous consequences that had been suggested.

The report is called "The Longer Term Review of Administrative Computing in Central Government" and was prepared by a committee under the chairmanship of Richard Wilding, deputy secretary in the Civil Service Department, which includes the Central Computer Agency. The study was initiated partly because of the criticism about large government computer projects such as the Swanaes Vehicle Licensing Centre.

It appears as part of a widespread cooling of enthusiasm towards wholesale introduction of computers and the government is expected to be less eager in future to introduce massive computer systems that may be made out of date by changing technology before they are ready for use.

In particular, there is much heated discussion at present over whether to computerise the collection of income tax, and this report may well swing that argument against computers.

Commenting on the report, the Civil and Public Servants Association said that any computer system could be replaced by manual back-up if necessary and strikes by computer staff would act mainly as an irritant to the government.

The Society of Civil and Public Servants, the next largest Civil Service union said that they were taking a militant policy on pay, and that they were committed to taking industrial action if the Government did not establish a pay research system. Computers would certainly be one of the areas involved, a spokesman said.

He pointed out that wastage of government computer staff at present was very high, because of the difference in pay levels between the public and private sectors. Some installations were losing 40% of their programming staff a year.

ASTMS highlights its strength in industry

DISCUSSION with NCR on grading and pay for engineers and a statement of its dominance, in terms of membership, within ICL are two of the highlights of ASTMS activity in the computer industry this week.

A joint meeting is to be held between NCR and ASTMS tomorrow (Friday) at NCR's London head office to discuss a proposed new job grading plan and salary scales for 800 field engineers.

Talks held last month broke down and the union negotiating team recommended that the engineers take industrial action (CW, June 1), but this has not yet been voted on. A second meeting will be held tomorrow afternoon at which ASTMS representatives in NCR will discuss the situation further.

On another front, Tim Webb, national officer for ASTMS, has asked that a meeting with the national officers of the other unions in ICL be set up to seek agreement on revised joint bargaining arrangements.

Webb believes that the present procedures do not reflect the correct membership positions of the joint staff unions, and has stated that "if these talks do not bring agreement, then we (ASTMS) shall have to look seriously at withdrawing from the ad hoc arrangements which were created during Phase I of the government's pay policy."

Setting out details of figures compiled by ICL on the sizes of various union memberships, they show ASTMS to be a clear winner with 8,978 members, while AUEW/Tass comes second with 783 members. The two remaining unions are APEX, with 615 members and the EETPU (Staff) with 197 members.

Logica gets extension to Saudi work

MANAGEMENT and systems consultants Logica, together with consulting engineers Frederic R. Harris, have gained a second year extension worth £1.5 million of a contract for cost estimating and budget evaluation from the Royal Commission for Jubail and Yanbu in Saudi Arabia.

The contract covers provision of services and development of systems, including evaluation of the benefits of using computers to replace the present manual systems.

Said to be the world's largest construction project, the twin new cities of Jubail and Yanbu are planned to have eventual populations of 150,000 each and the development programme involves about 200 different kinds of construction project.

US range additions

A SMALL business system is to be marketed by National Semiconductor in the US, as an addition to its operations in IBM-compatible computers and add-on memories.

Workers to be laid off by NCR at Dundee

A SWITCH in manufacturing policy by NCR will result in a considerable number of redundancies at the company's Dundee plant. Microprocessor boards for the 8100 family of small computers were to have been produced at Dundee both for the Augsburg plant in Germany, where the 8100 is built, and as a second source supply to the Common Market.

General manager at Dundee, Dick MacDonald, said the change of plan had become necessary because of "further technological simplification" of the microprocessor and 8100 manufacturing. The end product would now have less labour content and "it would thus be uneconomic to involve two European centres."

He said it was not possible to say at present how many redundancies would be involved because it was likely that some people would need to be transferred to other products that were expanding.

Dundee is the sole supplier in Europe of the 8100 series and the 8400 and 8500 Criterion systems.

There is also the 24-hour self-service banking terminal, the 1780, which was entirely designed and developed at Dundee and has already attracted the attention of US and Canadian banking organisations.

The 1780 has passed all its reliability tests and preproduction models will be undergoing final checks next month.

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If the RSRE run-time benchmarks are anything to go by, the HPA CORAL 66 compiler on a PDP-11/70 with cache memory (980ns) under RSX-11M (Version 3) has produced aggregate timings of 48.38 seconds. Of course, users run their own benchmarks — there is far more to our compilers than mere speed and real-time programming.

A competible compiler is available on Computer Automation's LSI-2 and another soon to be released for the NM4 series — cross-compilers also available!

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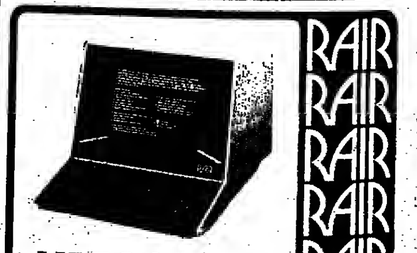
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The long, long registration queues were one of the features of the NCC this year. Some visitors had to wait up to four hours to sign up.

MALCOLM PELTU AND TIM PALMER REPORT FROM THE NCC IN ANAHEIM

Personal computers add spice

DESPITE a major challenge from semiconductor manufacturers and the mass-market gnawings of the personal computer market, the traditional computer industry put on its most prosperous face last week for the US National Computing Conference at Anaheim, California. The show has expanded to an unwieldy state and there were four-hour registration queues each day outside the conference centre. At the end of the four days nearly 60,000 people had attended the event.

The main excitement and tang of new ideas came from the growing "fringe" event, the Personal Computing Festival, held this year in the Disneyland Hotel. And the most significant conference messages came from the "outsiders," the semiconductor manufacturers which increasingly are encroaching upon traditional computer preserves.

It was fitting that two pioneers of semiconductors, Dr Gordon Moore and Robert Noyce, of Intel, won the 15th Harry Goode Award which honours the individuals who have made extraordinary contributions to developments in information processing. It is sponsored by the NCC organisers, the American Federation of Information Processing Societies.

A contents addressable file store costing about $500, for attachment to a micro system; a high quality full colour display for $1,395; a micro-based Monopoly game; and a micro-mouse maze competition were typical of the blend of almost unbelievable new commercial products and fun ideas at the personal computer show.

The potential of the booming new market appears to be unlimited, but a warning note was struck by Pertec chairman Ryal Poppa, who said there were bound to be some major commercial setbacks as the hobbyist and personal market grew rapidly towards maturity.

On the wider industry position, a key conference session was devoted to the impact of semiconductors on computer architecture.

Speakers from the solid state

● Turn to page 2.

MORE FROM THE NCC ON PAGES 2, 5, 7, 8, 9 and 56

Briefing

Warning on Cobol 80 costs

USERS may be faced with enormous Cobol conversion costs if the expected new Cobol 80 standards emerge from Codasyl in a few years, according to Paul Oliver, of the US Navy's Cobol compiler testing service. Speaking at the NCC in Anaheim, he said the new standards might be as different from Cobol 74 as that standard was from Cobol 68. He suggested costs of possibly $1 a line of code for conversion.

Captain Grace Hopper, who sponsored the development of *compiler validation procedures*, believes that this work must now be taken up by a wider user community insisting upon standardisation.

● See Software File, page 7.

Microwriter cash

FUNDING in the region of £250,000 is to be provided by Hambro Life Assurance for the Microwriter, the pocket word processor invented by Cy Endfield (CW, May 11). A team to manage production and marketing of the Microwriter is being set up and exploratory talks have started, in particular with consultancy Logica.

Prestel for Dutch

THE Dutch PTT has followed the West German Bundespost in buying a version of the Post Office's Prestel viewdata software and a 4080 minicomputer from SEC. The sale involves a version of the pilot trial software and the PTT has taken an option to buy the public service software later.

£3,000 saving

AN architect working for Trent Regional Health Authority has won an award of £3,000 for coming up with the idea of a computerised register of architectural drawings that has saved the authority £3,000 in one year. Software for the system was written by the Authority's computer department, and has been applied to the construction of psychiatric general hospitals at Chesterfield and Grimsby.

Testing time

FIRST examples of a Motorola 6800 microprocessor processed at the company's East Kilbride factory are now being tested. These are the first to be produced by the company outside America, and will probably go into volume production when an expansion programme for the East Kilbride plant is completed.

First electronic paper this year

THE world's first electronic newspaper, transmitting information digitally to its readers, could be in operation by the end of the year in the San Francisco Bay area, and the system, called Digicast, could be of interest to the United Nations for assisting in technological understanding and decision making.

The initial target of Digicast is the home computer user but it also offers many of the applications now being provided by information services such as viewdata.

Personal computing pioneer Jim Warren Jr, who is developing Digicast, said that the aim was to help people to cope with the vast amount of information being produced by using computers to do the initial scanning of the "newspaper."

Digicast would be transmitted using FM radio frequencies. Warren, founder of the West Coast Personal Faire, and editor of Dr Dobb's Journal of Computer Calisthenics and Orthodontia, said that a terminal for use with the system would cost about $100. The Digicast operation would be run on the lines of a newspaper, but the information collected would be transmitted virtually unedited to its "readers."

One "page" of text would be transmitted over the system every two minutes with the information being continually updated. A home computer would be used to "listen in" to the broadcast and select information according to predetermined criteria, for example, searching for a particular car for sale in a certain price range. Initially operating at 1,200 bps, printer terminals could be used to provide a copy of the selected information.

Warren already has provisional approval from the Federal Communications Commission, the US telecommunications watchdog, and during an informal discussion session at the NCC, a United Nations representative showed great interest in Digicast.

"Delegates attending International conferences, for example on technology transfer to the Third World, often have to make major decisions without having the full information at their finger tips," he said.

"A system like Digicast seems

● Turn to page 2

CIS Cobol adopted for R2E Micrals

FRENCH microcomputer pioneer R2E, in which CII-Honeywell Bull has now taken a 60% share, is to adopt the CIS Cobol compiler from UK systems house Micro Focus, for its Micral range which is based on Intel 8080 and Zilog Z80 micros. It was announced at the NCC that in the first year the contract will be worth £28,000.

CIS Cobol has already been adopted by Tandberg of Norway for its intelligent desk-top terminals and by ICL for the 1500 series.

Scots to spend £6m on 2900s

ORDERS worth over £6 million for ICL 2900 systems — to replace other ICL equipment and in most increased workloads — have been made by six Scottish regional councils.

Lothian Regional Council is to replace its System 4 with an ICL 2970 and a 2960, and one of the major applications will be a system for expenditure control.

Tayside Regional Council intends to replace its ICL 1902S and 1902T systems with an ICL 2960 and develop its police information system which holds criminal records. Similar police systems are to be adopted by Dumfries and Galloway Regional Council, which intends to upgrade its 2903 to a 2904, and Highland Regional Council which will be adding two EDS 00 disc units and two ICL 7502 communications processors to its 2904.

Hoping, in the longer-term, to introduce online facilities for its district authorities, Fife Regional Council has opted to replace its ICL 1903A system with a 2960.

The final council, Grampian, will shortly be switching its ICL 1902T for a 2960.

A major reason for the councils staying with ICL is believed to be the attraction of being able to run programs developed on the older machines on the new models under ICL's Direct Machine Environment firmware emulator.

All the systems will be delivered within 12 months.

Honeywell stake in Mark III

AFTER selling the General Electric Mark III time sharing services for several years in Europe and Australia, Honeywell is to take a 16% share in a new company that will sell Mark III services all over the world. The other 84% of the company will be owned by General Electric under an agreement in principle reached by the two firms.

The deal means that Honeywell will benefit from the substantial Mark III business in US

In Europe the new company will take over selling Mark III from the Network Information Services division of Honeywell in the UK.

The new company formally starts operations on November 1.

COMPUTER WEEKLY'S INSIDE NEWS

This week Computer Weekly carries extensive reports from the National Computing Conference, held last week at Anaheim, California. But as usual there is also the wide coverage news and views from all quarters . . . A ban on political parties and censorship of the Press. Just two of the features of the world that David Eytler forecasts in his Computer-style 2000 essay. He sees this rather grim society as the result of the community's inability to appreciate and control the changes forced on it by technology (page 11) . . . It has been suggested that the chaos of standards that now exists in the computer world will be resolved by evolution. However, a Special Correspondent suggests that a state revolution may be needed if headway is to be made (page 4) . . . The search for a language for machine translation goes on. The case for Logian is argued (page 16) and several readers put their views on page 17 . . . Tom Gilb declares that verification should be dead (page 6) and Software File looks at some of the latest enhancements to Total (page 7).

ALSO . . .
Computer-aday on the software revolution . . . 2
Focus on crossed lines . . . 3
ICL's new machine . . . 4
Downtime . . . 4
Profile of a typical customer . . . 5
Software File . . . 6/7
Puzzler . . . 7
Programmer Notes . . . 8
People in the News . . . 10
Computasters . . . 10
Electronic mail on way . . . 12
On Spot . . . 13
A look into the future . . . 14
Word processing show . . . 14
Logic of a language . . . 16/17
Staff problems . . . 18
Barclaycard banks on master training . . . 19
The Sales Bit . . . 53
The Hex Kid . . . 53
Product News . . . 54
Stocks moved . . . 56

APPOINTMENTS PAGES 23-54

Design Brief

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Everybody is talking about it...

IT was a long time ago that Mark Twain said, "Everybody talks about the weather but nobody does anything about it." Today he might put it "Everybody talks about the Social Impact of the Microprocessor Revolution but . . ." And he would be right. The Labour Party, under the leadership of Tony Benn, is talking about it; there are two groups of Tory MPs talking about it; the TUC prompted by ASTMS, is talking about it, and several pundits have made speeches that have been reported with much solemnity in the Press, all agonising over our seemingly inevitable large-scale unemployment, to go with the large-scale integration.

In its eagerness to get to grips with the problem, the official Conservative group has engaged as its external technical adviser Professor Donald Michie, a life-long Socialist. The other group, for backbenchers, had some difficulty organising its first meeting. The invitations, it seems, had computer chips taped to them for added impact, and several MPs mistook them for letter bombs.

Even in the wilds of Saskatchewan a "Social Impact" committee has been formed.

The National Enterprise Board, on the other hand, is thinking of setting up a rival Silicon Valley in the North of England. They may experience some difficulty — Germanium Dale does not have quite the same ring about it, and it would not be surprising if our expatriate engineers were reluctant to exchange Palo Alto for Huddersfield. This is, of course, working to aggravate the Social Impact problem rather than relieve it.

Meanwhile the prophesies of doom continue to fall like Bob Dylan's Hard Rain, and talk abounds of work being a privilege by the end of the century, a mind-boggling concept for those of us whose days could easily be 36 hours long without exhausting the supply of things that needed to be done.

Interestingly enough, there are those who say new technology will present the opposite problem regarding employment. Harry Belsey, of BP, pointed out last week that Prestel alone will carry a million pages of text, and many similar systems will doubtless spring up. "Where are we going to get the keyboarding effort to fill all those pages?" he asks. Alan Benjamin has pointed out that electronics has created three and a half million new jobs in the US since 1965.

The visions of gloom are based on what economists call the "Lump of Labour Fallacy" — the notion that there is a fixed amount of work to be done in the world, and people displaced by machines will inevitably have nothing else to do. In fact, as can be seen from the history of the first Industrial Revolution, technological changes produce entire new industries that no one had dreamt of before, and there is every reason to believe this can happen with the Second Revolution, too. Just reflecting on the state of most of the world, one realises there is a great deal still to be done.

What will certainly happen is that fewer jobs will involve purely mechanical operations, and more will involve creativity and the making of value judgments, and this is all to the good. It will, however, have traumatic effects on much of the working population.

The talk will doubtless continue. Hopefully it will develop along more positive and practical lines than all the wailing and gnashing of teeth we have heard hitherto. Then eventually there might even be some action.

For the present, let the last word be this story, currently going the rounds of the Post Office Engineering Union:

"What is the staffing level for the new System X exchange?"

"One man and a dog."

"What does the man do?"

"Feed the dog."

"What does the dog do?"

"Make sure the damn fool man never touches the equipment."

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FOCUS

BY now Focus would have thought that the Post Office had got the industry message. But at last month's DPMA Conference, Practical Communications, two representatives of the Post Office were noticeably sitting in the front row.

No doubt their subsequent report to the Post Office Establishment was gloomy. In fact, they could hardly have chosen a more hostile venue. "Knock The Post Office" was very much the theme of the day. As far as the DP industry is concerned, Post Office lines of communication are certainly crossed. Good words for the Post Office were few and far between — adverse comments being in multiplex mode. The conference was perhaps mistitled. A more realistic theme could well have been "Before setting up a data network, first sort out the Post Office."

The Post Office apparently offers not so much a guiding hand, but a restraining boot. Predictably, John McNulty from Modular Technology, had some harsh comments. "The future for datacom was glorious and exciting. The only handicap to progress was the UK Post Office."

John McNulty did not criticise the Post Office in making a vast profit, providing it was not achieved on a monopolistic basis and that large-scale users were not subsidising the smaller user.

The Post Office Act has turned out in practice to be a total wrong number. It is a rag-bag of an Act which incidentally, appeared to be contrary to the EEC mandate which stipulates that monopolies — both private and State — must not act unfairly.

Consultant Iann Barron was equally forthright. Post Office charges he declared, are not based on cost but on what the market can bear. In effect, the Post Office pension fund seems to be dictating the policy. Technology should be the means of reducing costs, not as the Post Office prefers, a method of extracting ever greater sums from users.

Dr Adrian Stokes from Langton Information, kept his head well down in the Post Office stakes, and limited his talk to the impact of communications on computing. His suggestion, however, that the teleconference method of communication was the ultimate solution, was challenged from the floor.

By now delegates to such conferences know what to expect. Praise and congratulations will be in short supply. The fact that most present will achieve much, despite near-insurmountable odds will go unrecognised. Such odds include devious DP teams, hesitant management, unhelpful users and reluctant machines. No wonder with all these problems, polite communication is seldom feasible.

Similarly, it seems that the Post Office gets all the kicks. Ignored are the often highly competent engineers in the field. Post Office Acts, at this level, could well involve working beyond the calls of duty (or unions) with a large dose of personal involvement. Somehow the Post Office lines always seem to get crossed. Buzby would be better employed bugging the Post Office higher executive than the TV viewer. Likewise, the DPMA would have been better advised in the interests of the whole industry, to have included a senior official from the Post Office itself purely to keep the balance.

Confrontation on this scale would have achieved much in the cause of practical communications.

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Ten years ago...

COMPUTER WEEKLY JUNE 13, 1968

THE first general production of Braille texts with the aid of a computer was to be undertaken by the RNIB ... A merchant bank, Singer and Friedlander, placed the first order for an online system with Burroughs ... An agreement was signed between Ferranti and a Swiss electrical firm to market Argus computers in Switzerland ... Hungary's first domestically designed computer, the EMG 830, entered the production stage ... Train movements along the 47 miles of railway track around Leeds City station were being monitored by an Elliott 903 ... Eleven technical journalists "went back to school" to learn about computers, on a two-day appreciation course arranged by NCR.

INTERRUPT

ONE day a programmer, having nothing much to do at the time, amused himself by writing a program whose sole function was to keep on changing its own ID.

He tested it and it worked very well. The trouble was that, when he tried to delete the program, as soon as he had discovered its current ID this had been changed to something else. The only way that the program could be deleted was by means of a halt/load.

The Moral: Don't start something that you can't stop.

● This week's £5 Interrupt prize goes to G. B. Darrow of Orpington.

MORE FROM ANAHEIM

Compucolor II—the most talked-about system at the NCC

"I HAVE not been so excited by a new product since I first saw a time sharing system being demonstrated," was the reaction of an experienced British computerman to one of the most talked about systems on show at the NCC, at Anaheim last week — the Compucolor II personal computer system.

The high definition, high quality colour display of the Compucolor II, including simple to use picture-building capabilities, which had a dramatic impact on the crowds at the Compucolor Corp stand, makes the system ideal for the educational as well as home and business market.

After viewing the system, many of the NCC visitors said that it would be difficult to go back to plain grey and white screens.

Like many of the other exhibits in the personal computing fair, the Compucolor II's price is perhaps its most amazing factor. A basic configuration costs only $1,395 for a system including 6K of random access memory, a 32-line x 64-character display, 75K bytes of mini disc storage, a Basic compiler and vector software. The system is based on an Intel 8080.

In the two months since it was announced, the Compucolor has taken about 1,700 orders and a production line is currently being set up in Norcross, Georgia, to produce about 150 a month. First deliveries are due this month.

Compucolor applications engineer Ron Westmoreland told Computer Weekly that the system is likely to be introduced to Europe in about six to eight months, by which time the company could cope with the expected increase in demand.

Electronic paper

● **From front page**

to offer the capability to disseminate up-to-date information quickly. The UN will be very interested in the development of Digicast," he added.

But Warren emphasised that although this could be a potential application, his immediate aim was to provide a "newspaper for the general public". He said that there was an information explosion and by putting information in machine readable form, computers could be used to scan and present information that was relevant to any particular need.

He did not like systems such as Oracle and Ceefax because they assumed the recipient had a dumb terminal, and such systems did not update information quickly enough.

The system would provide a major boost to the home computer market, he said, because it would open up new and wide ranges of useful functions. Warren said he believed he could get stock exchanges, news services, airlines and other information providers to join in the system as well as individuals.

Access to the service would be free but he hoped to pay for it with revenue from advertising.

Personal computers

● **From front page.**

companies made it clear that there was the possibility of a bloody battle between them and the computer manufacturers as the semiconductor makers increasingly became systems, rather than components, suppliers.

Loud applause greeted Bob Heikes, assistant general manager of semiconductors at Motorola, when he summarised a key issue of the future by saying that it was all about "the irresistible force of VLSI meeting the immovable object of software."

The lack of software engineering standards, he said, was intolerable to the semiconductor industry, which had to be able to produce reliable, low cost products in massive quantities in order to grow.

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ICL 2972 offers 50% more power

TO ward off increasing competition, primarily from IBM with its low-cost 303X computers, ICL has introduced a new machine, the 2972, and an enhanced version of the 2976, both of which employ low-cost 16K bit memory chips.

The 2972 costs only slightly more than the 2970, but offers about 50% more power. And like the 2976, the 2972 has the same order code processor as the 2980.

As expected, one of the first customers for the 2972 will be Oxfordshire County Council (CW, June 8), which is having a 2.5 Megabyte system. The 2972 will provide Oxfordshire with more than three times the processing power of the 1904S it is replacing.

The council says that it will need the extra capacity for the teleprocessing network that it is implementing.

To make program conversion easier for the 2972 or 2976 customer, ICL has also introduced an enhanced version of the Direct Machine Environment emulator called DME+. This enables a 2960 order code processor running 1900 or System 4 programs under DME to share a common storage system with a 2972 or 2976, operating under VME/B.

In this way the user can enjoy DME facilities without having to install a complete 2960 system, and can phase out the 2960 processor when conversion to VME/B is complete.

DME+ also offers 25% better performance than the basic DME/1900, whether it is used when the 2960 is associated with a 2972 or 2970 or when the 2960 is operating in stand-alone mode.

The storage systems supplied with the 2972 and the new 2976 have the same type of store access controller and store multiple access control, but the main store of the 2976 is faster because it is interleaved. The maximum main memory size on the new 2976 is eight Megabytes and the overall performance of the new machine is about 20% better than the existing 2970.

ICL points out that the new 16K bit chip store can be used to enhance the 2970 and the older 2976. A 2 Megabyte store using the 16K bit chips occupies only two cabinets, while the 1K bit chip memory supplied with the older 2976 required six cabinets to provide the same capacity.

A basic single system 2972 costs between £1.3 million and £1.8 million, while a basic 2970 single system ranges from £1.5 million to £2 million.

An option for the new and the older 2976, just introduced by ICL, is the ability to enhance on-site to a dual system. Also available now as options for the 2972 and 2970 are a fast multiply/divide unit and a micro-coded maths library.

These will improve the performance of programs compiled by the OFC60, optimising Fortran compiler, and programs that make extensive use of multiply and divide operations.

● Another new product announced by ICL is a 6250 bpi density magnetic tape system, the MT 1250, which can be used with 2970, 2972, 2976 and 2980 systems running under VME/B. The MT1250 provides up to four times the data transfer rate of 1600 bpi tape systems and uses the group code recording format.

Hughes

Hughes to chair advisory committee

A TECHNICAL advisory committee has been set up by the National Computing Centre, under the chairmanship of Philip Hughes, chairman of Logica. The committee will advise the NCC's director, David Firnberg, on technical matters, and its recommendations will be reported by him to the full National Computing Centre board.

Hughes said that the NCC had established itself as a widely accepted authority on computing matters, but the constant impact of new technologies meant that it was necessary continually to review and develop its role.

He saw the advisory committee as having an important part to play in the NCC's future.

Hughes has previously served on committees of the Science Research Council and as a member of the Computers, Systems, and Electronics Requirements Board. He was one of those responsible for founding Logica nine years ago.

The names of the other members of the committee have yet to be announced.

'Students put off by unions'

BRIGHT students are being put off going into engineering by requirements for trade union membership, claims the Engineering Professors' Conference.

In its submission to the Finniston Committee investigating the engineering profession, the professors attack efforts both by the unions and the Engineering Employers' Federation to push professional, graduate engineers into the engineering unions.

Professor Arthur Shercliff, of Warwick University, asked: "How can we say to a really able student at school, 'your career choices are going into medicine, or law, or joining TASS'?"

Employers were often more likely, he said, to ask whether an applicant was a member of a "right" (that is, CSEU-approved) union than to consider academic achievement.

Professor Shercliff also attacked the tendency to consider associations of engineers as "splinter groups," as had been done in a leading article in the Guardian on June 5.

"You might as well say, he said, "that as the TGWU is the biggest union in the Health Service, the BMA is a splinter group."

The Committee of the Engineering Professors' Conference is recommending to Finniston that a new two-stream degree course for engineers be set up in universities and polytechnics.

Univac bubble memories decision

A DECISION is expected within six months from Univac whether to start in-house manufacture of bubble memories. The company's main interest stems from the Defence Systems Division, but if manufacture started, the commercial side of the company could be expected to use the devices also.

Also under consideration, as an alternative strategy, is a purchase agreement with one of the existing bubble memory manufacturers.

Typesetting direct from word processor

HARDWARE for typesetting direct from a word processor has been introduced to the UK market by Gestetner, the duplicator firm. Gestetner has taken the franchise for in-house printing of the Compugraphic range of phototypesetters, from the US.

Gestetner already sells large numbers of small offset printing presses to firms that wish to do their own printing rather than go to outside printers, and this new equipment will allow them to do their own typesetting as well.

Compugraphic makes a unit called WordCom, which accepts magnetic cards or floppy discs from a word processor and converts the text into a form usable by the EditWriter typesetter. This means that documents originally prepared on a word processor can be typeset without resetting, apart from some editing.

At present there are three models of WordCom, capable of accepting media from IBM, Redactron, or Vydec word processors. Each will cost between £5,000 and £6,000. The EditWriter model 7500 sells for £14,050.

This WordCom should not be confused with the word processor of the same name sold by Interscan.

IBM typewriters launch

TWO new electronic typewriters are soon to be introduced in the US by IBM. Called models 50 and 60, they will have internal memory for a single line of text and one or two pages respectively, and are intended to compete directly with the Qyx low-cost word processor launched earlier this year by Exxon (CW, Feb 23 and April 6).

Unlike Qyx with its daisy wheel, the IBM machines will have golf ball typing elements, thereby utilising the large stock of golf balls already in existence. This is despite the fact that IBM has already introduced a daisy wheel printer (made by Qume) to its Office System 6 word processor range.

The launch is expected at the Syntopican word processing exhibition in Washington later this month.

Total for Series 1 this year

A NEW mainframe incarnation of Total, believed to be the first truly multi-tasking, multi-threading DBMS, has been launched by Cincom systems, together with an online query system for end-users. The company also confirmed that Total would be available for IBM's Series 1 by the end of the year (CW, January 19).

The new Total release runs under IBM's DOS/VS, OS/VS1, OS/VS2, and MVS. T-ask, the interactive query facility, is an add-on to Cincom's TP monitor Environ/1, but will also be available under other TP monitors via the inclusion of a cut-down version of Environ/1.

● More details, Software File, p.7.

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DOWNTIME

by Chad

Cycling the results

DO you have a pair of giant milk bottles beside your desk? The gentlemen in my picture are not measuring the output of cows, but keeping track of the placings in the round-Britain cycling Milk Race, using a Texas Instruments programmable calculator.

Computerised time-keeping of races is all the rage nowadays. The Manx government's Univac 90/30 is being used at the Isle of Man TT races this year. As an example of hitching up a carthorse to Concorde this could hardly be bettered — the figures are read off a VDU and painted on to a scoreboard by hand!

Computers were introduced into the Head of the River Boat Race on the Thames several years ago, replacing a manual timing system of awe-inspiring complexity. I was once (not *that* long ago) drafted into the team of schoolboys carrying out this job, sitting at a long line of tables in an hotel in Putney, filling out cards and passing them on to the next boy, without the slightest idea of how the whole amazing scheme worked. It did, though.

Golden Fleece award

THE Americans have a way of making their government colourful. Senator William Proxmire, scourge of the Washington bureaucracy and critic of dubious computer projects, has taken to presenting a "Golden Fleece Award" to the government project involving the most ridiculous waste of taxpayers' money each month. Among the winners have been a study on why people fall in love, an experiment on how long it takes to cook breakfast, and a study of relationships in a Peruvian brothel.

Many of the recipients of the award are scientists, who, naturally enough, fight back. One winner, an astronomer who is using NASA's radio-telescopes to listen for signals from extraterrestrial life, says of the Senator, "He deserves an honorary membership in the Flat Earth Society."

THE standardisation situation as it affects the European computing scene was the subject of a recent seminar in Paris when the transition from today's somewhat chaotic position to a more harmonious future was examined. With the emphasis on evolution rather than revolution, our SPECIAL CORRESPONDENT, nevertheless, sets out here to show why a little revolution may be necessary if headway is to be made in the important field of standards.

Where next with standards?

STANDARDISATION is seen by many responsible for computing policies as the key to future systems development. The need for standards for effective interchange of system elements, their interworking and quality assurance, was highlighted in an NCC report early in 1978 which generated considerable interest. It discussed the vital importance of standards especially in some rather mundane areas, such as character codes and sets, and data element representation where common implementation levels are vital.

Standards are important for another reason. If the number of computing systems increases as forecast, especially the number of microcomputers, then systems development on a one-off basis using today's methods has already led to cynical forecasts that almost every intelligent resident of the UK, able to program, will be programming by the year 2000! The implication is that system transfer, and interworking *must* be made possible to avoid such a situation, and its obvious economic implications!

At the end of April a seminar was held in Paris to explore the situation, particularly within the European context. It was jointly organised by France's BNI Bureau d'Orientation de la Normalisation en Informatique (Office of the Directorate of Standardisation in Informatics) together with West Germany's GMD and the UK's NCC and sponsored by a number of bodies, including France's IRIA and the CEC (EEC) Directorate-General III. Its objective was to examine the transition from the present somewhat chaotic position to a (hopefully) harmonised future. The accent was very much on evolution rather than revolution, though the author's opinion is that a little of the latter may be needed if headway is to be made.

Standardisation, and its effective application, is seen by many authorities as the key both to development of the next round of computer applications, particularly those where interworking networking forms the basis of a multi-user system, which in many cases will include system components obtained from differing sources. The process of standardisation includes identifying the need for a standard, developing and specifying an appropriate standard, and its promotion, implementation and application. The last-mentioned stage should involve quality assurance, a much neglected area within computing.

In reviewing the present scene at the beginning of the seminar, NCC's Ray O'Connor examined the area of implementation of existing standards, and concluded that quality control is badly needed. An NCC audit of the implementations of standards for information codes showed that in the case of CCITT International Alphabet No 2, 47 out of 59 characters were correctly implemented by all implementations, while in the case of the ISO 7 standard, the score was 54 out of 128 characters. EBCDIC scored 49 out of 256. There is a clear need for audit aids which automatically audit implementation and check their alignment with the specification.

Pioneer examples are the US Navy's Cobol and Fortran aids distributed by the BCS in the UK. The speaker went on to illustrate the urgency of the need by highlighting the likely explosion of the number of computers at work, especially as the number of microcomputers rapidly increases. The same point was raised in a lecture on compatibility by GMD's Dr Eckhart Ranbold.

> *The process of standardisation includes identifying the need for a standard, developing and specifying and appropriate standard, and its promotion, implementation and application.*

The value of standardisation was clearly demonstrated by Don Trafford of the UK's Simplification of International Trade Procedures Organisation (SITPRO). The benefits of standardisation in that area are hard to quantify, but the benefit accruing from easier intercommunication between exporters/importers, carriers, agents, government bodies such as Customs and port-authorities will be very considerable. Without such standards the need for inter-standard conversion aids and programs is roughly proportional to the square of the number of differing systems, demonstrating the build-up of chaos likely to result from non-aligned systems which will be inevitably passed on to the consumer as higher cost. This is an area where prospective standardisation is most urgently required ahead of widespread implementation of differing subsystems.

The machinery for the development and endorsement of standards was reviewed by Hugh Ross, chairman of the DP Committee of the British Standards Institution. He contrasted the performance of a "closed" standards-making body, consisting of bodies with a similar viewpoint, CCITT, with that of ISO. Of some 350 current CCITT standards some 20% are updated each year and it has some 80-plus projects in hand. In contrast, ISO's corresponding committee, which necessarily must involve a wider range of participants with differing and sometimes conflicting interests, has only published some 11 standards in the same area, although it has circulated some 1,600 documents to date! Other resources needed were identified by the same speaker and included money/manpower for the development of standards, and an information service so that users can locate standards where they need them, and relevant information analysis and recommendations, as a back-up support service, where appropriate.

The rapidly increasing importance of standards for open system working was highlighted by Hubert Zimmermann of IRIA, the chairman of the Architecture Working Group of ISO's Committee in this area, SC16 of IC97. He illustrated the vital role of such standards in unrestricted interconnection — the key to general information networking and thus many future applications — which is to become practical and economic. This was also highlighted in "Why high level protocols are increasingly important" (CW, February, 1978). Forward compatibility of systems and applications with any manufacturer's equipment, thus eliminating conversion problems, was illustrated by this speaker.

His comments were echoed by Dr H. J. Burkhardt of GMD, and Ray O'Connor both of whom foresaw increasing interconnection of differing systems. The latter mentioned the integration of a number of computing areas such as DP, scientific computing, CAD, and process control.

Procurement policies were seen as the key to getting standards implemented, by Harry White of the US National Bureau of Standards, and he outlined the policies now being pursued by the US General Services Administration.

These require new equipment acquired to align with standards, and the US is pursuing a policy of progressive alignment of all its equipment with relevant standards.

Some of the obstacles to standardisation seen by various speakers and contributors from the floor included resources — most standards *development* is still done by voluntary effort and funded professional help would accelerate production. Others included quality assurance, based on either full testing of all implementations, or a sample only; and also an urgent need to develop mon-system interface standards, an area where little work has been done.

During discussion, Ray O'Connor reported the experience of one UK company which has run into difficulty in consequence of an intelligent interpretation of a standard — in this instance in connection with the packing of file labelling information in such a way that the labels could no longer be read by other standard equipment. Standards extension was raised by J. M. Sykes of ICI and chairman of BSI Committee DPS/13, who suggested

● Turn to page 14

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NEWS IN BRIEF

Poly centre to cost £185,000

THE Department of Education and Science has approved a £185,000 scheme to build a new computer centre at the Lanchester Polytechnic, Coventry.

The centre is to house the Polytechnic's ICL 1903S which is used mainly for teaching and in-house work. Building is due to start next year and should be completed by Christmas, 1979.

LAMSAC choice

TO help in its statistical and analytical work on behalf of 521 local authorities in the UK, the Local Authorities Management Services and Computer Committee has installed an ICL 1503-43 system at its Central London offices. Previously, LAMSAC used local authority computers for this work.

JPs' rotas

TO ease the time-consuming work of preparing justices' rotas, Scicon Computer Services is offering Magsit, a computer service run from its bureau at Milton Keynes. Up to 15 types of courts can be dealt with, and information on courts and magistrates is submitted on standard forms to Scicon. A complete annual rota is available within 14 days.

Bakery network

AN ORDER worth £175,000 has been placed by Allied Bakeries with Racal-Milgo. This is for 9B Multi-Mode and MPS 48 modems and T-bar switching equipment, for use in Allied's 46-site management network based on Honeywell 60 mainframes and Level 6 minicom*puters*.

Faster data

DATA can now be sent to Singapore at 2,400 bps. And the charge, at £1.50 per minute, is the same as the previous slower services, International Datel 200 and 600. The new service is International Datel 2400, and its introduction to Singapore follows successful operation to Bahrain since April.

Automatic answer

A NEW automatic answer facility, the 301-AA, announced by Borar Electronics of Wokingham for their 300 bps modem, enables an unattended computer to respond automatically to incoming calls. Both line connection protocols covered by CCITT recommendation V25 can be used with the 301-AA, which costs £250.

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Profile of a typical computer store customer—US style

THE typical computer store customer in the US is an engineer, aged 29, earning $21,000, who belongs to a company of fewer than 20 employees and has had over four years of college education. And self-education or game playing are the most likely applications of the personal computer.

That is the finding of a survey* conducted on computer store customers, by Image Resource of Westlake Village, California.

According to the survey, 27% of customers were engineers, including 46% in manufacturing industries. Programmers at 14% of the total were outnumbered by students, who were 16% of customers. Doctors and accountants both took up 2%.

Although the personal computer market is often seen as a young person's hobby, 45% of the customers were over 30, with 16% over 40. Self-education was given as a reason for buying equipment by 61% of customers, exactly the same figure as for those who wanted to use it for games.

Software development was identified by 57% of the users and word processing by 31%. And a sign that the systems are rapidly being integrated into everyday life is that 30% are using personal computers for school work.

Some 53% of customers repaired the systems themselves and 39% expected the store to undertake maintenance, a sign that the mass personal computer market is radically changing the user/manufacturer relationship.

*1978 Profile of Computer Store Customers $169. Published by Image Resource, 717 Lakefield Road, Suite B, Westlake Village, California, USA.

Personal computing comes of age at Anaheim

THE personal computing market seems to have come of age in only 12 months. It was first featured at the NCC last year in Dallas, where a handful of hobbyists gained enormous attention for ingenious but amateurish exhibits; and by 1978, at Anaheim, the centre of the stage was taken by small companies offering business applications on microcomputers, and companies offering low-cost peripherals.

Typical of the products featured was the new R2E Micral V microcomputer in a suitcase, first shown at Sicob in Paris last September. Complete with strip display, keyboard, printer and two minifloppy drives, all driven by a Z80, Micral V attracted enormous attention at the show, where the French company's US subsidiary offered it at $6,250 in quantities of 50.

"We have just started operations out of our subsidiary in Minneapolis," Thi Truong, R2E founder and president, told Computer Weekly. "We are also introducing the Micral CM multiple microcomputer system, consisting of a data file management processor capable of supporting up to four independent microcomputer stations, each with its own local memory, input-output bus and serial input-output channel.

"The stations can support a local or remote terminal, which can be anything from a CRT display to a Micral C or Micral V system.

"We are building the Micral CM in the US for the local market," he added, saying that the system can support up to 80 Megabytes of mass storage and is programmable in ANSI Fortran IV, using the Fort/80 compiler on licence from Unified Technologies of Toronto. It is also programmed in the standard Micral BAL language, and CIS Cobol from Micro Focus of the UK will be available shortly.

Typical of the applications now being pursued by the so-called hobby market is medical data management for doctors. An attractive product for this market was exhibited by PAM, Professional Accounting Machines, of Santa Ana, California.

The Medac 310 system for PAM includes a small neat video terminal, 8K OF RAM and 12K of ROM backed by dual floppies and supporting a fast character printer, and is programmed to handle patient billing, insurance claims preparation, debts, a daily and monthly financial summary, patient account listing and daily appointment calendar, and costs $18,974.

Motorola hits the jackpot

CLAIMED as the largest order for microprocessors and related components outside the US, Motorola is to supply £350,000 worth to Barcrest, of the UK's leading makers of fruit machines.

Barcrest managing director John Marshall said his company was planning to use micros to win export markets.

"Each nation has different requirements both in fashion and law," he said. To meet these varying needs the company is now building a standard controller that can be programmed to suit market requirements.

Sintrom to sell Centronics range

THE full range of Centronics line and character printers are to be sold in the UK by Sintrom following the completion of a deal between the two companies. Sintrom will be providing servicing and support for end users throughout the country.

Zilog claims 'best of 370 and PDP-11 families' for Z-8000 16-bit micro

THE best attributes of the IBM 370 and Digital Equipment PDP-11 computer families, without their worst attributes. This is what Zilog is claiming for its Z-8000 16-bit microprocessor, scheduled to be introduced towards the end of the year.

Some of the aims of the California-based micro-maker were outlined by Northern European marketing manager, Phil Pitman, when he talked about the details of the device at last week's meeting of the BCS microprocessor specialist group.

The design of the Z-8000 had been heavily influenced by the successful 370 and PDP computer families, as well as by Zilog's own Z-80 eight-bit device. The company's design team is trying to incorporate the advantages and eradicate the disadvantages in the architecture of the new micro.

The Z-8000 will be capable of dealing with data elements ranging in length from single bits up to 32-bit words. The full instruction set will incorporate over 110 instruction types.

To increase the direct memory addressing capability beyond 64K bytes, the device will utilise a segmentation approach to allow direct addressing of up to 8Mbytes. The memory will be made up of up to 128 segments, and the addressing will be handled by a memory management chip due to be launched during 1979.

There will be two versions of the Z-8000. The 8 Mbyte chip will be housed in a 48-pin package, while a 40-pin version will be available for applications which do not require the high capacity memory addressing. This version will directly address 64K bytes. The extra pins on the 8 Mbyte chip are for connection to the memory manager.

With a 4 MHz clock rate, minimum instruction times for the devices are about 750 nanoseconds. Initial software development will be possible on the current Z-80 development kits and this will include in-circuit emulation. A dedicated development system is being designed.

Zilog has already carried out some comparison tests on the Z-8000, and found that its minimum instruction cycles beat the PDP-11/34. It estimates that in program handling, the device should be equivalent to the PDP-11/70.

GOVERNMENT COMPUTING

DEPARTMENT OF TRADE (MARINE DIVISION)

Replacement plotting equipment (either pen or electrostatic type) is required. The existing hardware consists of a small incremental digital plotter and controller driven locally by a Varian 5500 series machine.

Applications for operational requirements, quoting CEH5, to Central Computer Agency, Room 822, Riverwalk House, 157-161 Millbank, London SW1P 4RT.

Gemini moves into the recruitment field

MOVING into the people market, Gemini Computer Systems, the UK subsidiary of the CAP/Gemini/Sogeti group, has set up a recruitment and staff selection operation. Initially based on Gemini's Manchester office, it is planned to extend the service later to cover London, and Ian Bacon, formerly with Combyte Services in Manchester, has joined the company to manage the new section.

Peter Clarke, manager of Gemini's northern region, said Gemini had decided to venture into the personnel field because many clients had asked for recruitment advice and assistance. The new service is independent of Gemini's software activities but will be complementary to it.

SOCCER

Summer Computer League

High-scoring Statfacsing are clear leaders of Division 4 after defeating C. J. Bee's and Wellorex 9-3 and 12-0, respectively. The results are as follows:

Division I: Rank Xerox 1, SIA 4; Comshare 2, Datespene 3.

Division II: Atkins 1, Lambeth 2; Alterga 2, Datasolve (City) 2.

Division III: JPC Victoria 2, Gill & Duffus 4; 3M 5, Airfix 2; Xerox (London) 3, JPC Victoria 1 5; Xerox (London) 1, Datasolve (West End) 2.

Division IV: Burst DS 1, UCSL 2; Statfacsing 12, Wellorex 0; C. J. Bee's 3, Statfacsing 9; Computer Weekly 0, Burst DS 0.

Division V: Jadpo 4, Sherwood CC 5.

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GILB'S MYTHOLOGY

Verification dead—almost

I KNOW some of you will find this incredible, but there are still computer installations which use repetitive keying of input, and a second look at the source document, as a way of checking the validity of input data capture.

This technique, which I will call "verification" here, might even be unknown to the many readers who have been born directly into an online interactive environment. But such techniques continue to flourish.

Not too many years ago I could find a typical commercial DP installation where at least 30% of the keying devices were specialist verifier punches, and this gave some idea of the amount of work still being verified. These days the amount of verification being done is hidden because of the multipurpose nature of the encoding machines.

But I regularly come across recently planned commercial and even technical engineering systems where repetitive verification is being used as a means of checking the quality of the original keying. The continued use of repetitive verification in new designs is, in my view, a sign of lack of imagination or of training of the designer.

One of the points against verification is its high cost. It requires an extra person-process, not to mention machine, and people are becoming expensive. In some countries, this might create employment, and be desirable, but in others it simply results in increased import of cheap foreign labour, or the export of the keypunching jobs.

It is my experience that we are not unwilling to improve this process, but I have met system designers who claim that there is no better way of doing it. This has always turned out to be untrue, when they have had the opportunity to evaluate techniques of which they were not aware.

There is no one superior technique to replace verification. That is precisely the advantage of verification. It is highly generalised. One need not know much about the application, but merely repeat the keypunching instructions. The only justification I have found is where an immediate thorough check of keying is required for an application which is entirely new and which is not worth any long term investment in analysis and design of other checking procedures.

Here is my checklist of the techniques which in one combination or another, can replace repetitive verification.

1 Get the source to provide machine readable input. For example the bank could supply a tape of transactions instead of a list.
2 Let the data source decide the amount. Years ago in Datamation an American company reported letting their suppliers fill out the amount the company owed, on a blank signed cheque. The bank then got the keypunching job, and the suppliers got the "correct" amount. There were maximum-amount, and responsible-supplier controls, of course, and the system worked out very well.
3 Automatically self-adjusting reasonableness checks. Check the quantity in relation to a programmed note in the product record of the maximum amount validly ordered. Or the largest amount posted to an account. This may require extra fields in database records, but existing fields, such as year-to-date or last-month quantities may give interesting reasonableness tests.
4 Use a default quantity. In one application we found that 90% of all orders were for quantity one.
5 Logical deduction of the field. In one charter aircraft application there were eight six-digit dates on a form. All were currently being keyed, written and verified. Most dates were the same, or related to travel distance, start time, air speed and crew resting rules. Better to let the computer work out most of them, and let humans intervene for exceptional circumstances.
6 Don't verify at all, take a chance. What is the maximum error? What is the cost of an error? What is the cost of the verification? The answers may lead you to drop verification.
7 Use the side-by-side repetition method, for example 123 123. This does not cost as much as verification. It can be done by exception (for example, for the three per cent of orders with two digits or larger order quantities), and the program can read both attempts, check that a second attempt has been made, prompt the operator when it has not, give alternatives when there is a difference, and even select a probable alternative.
8 Distinct repetition method. This is the same as the ordinary repetition on the same input record, but some of the problems of input parroting are solved.
9 Check sums. The old tried accounting method. Here for completeness sake.
10 Use grouping concepts to simplify numbers and to introduce checking redundancy at no extra cost. For example, PK meaning whatever quantity is in a package of that item identification. DY meaning however many hours of work in a normal working day of that date for that class of worker.
11 Use "Check words" which are quantities. For example, item and price, or person and birthdate. This concept acts as a powerful double check on not just the quantifier, but also the identifier.
12 Let the receiver verify. In one case where 100,000 insurance client names and addresses were converted to gibberish, we let the post office try to deliver bills, rather than checking a million policy records ourselves.
13 Pattern checking. Quantity patterns which are normal are recorded (automatically) for each item, account, etc. The input is checked against these.

GILB'S HYPOTHESIS: Repetitive verification is obsolete, but we don't all know it.

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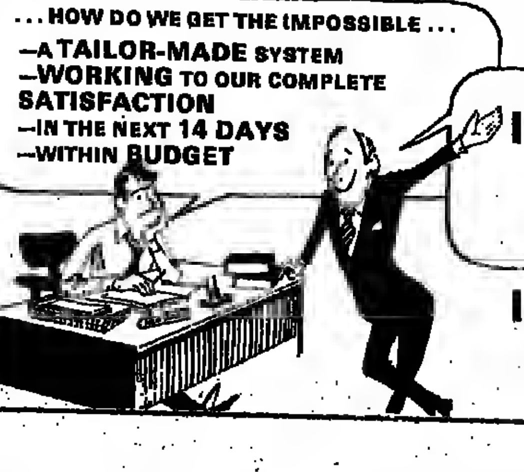

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SOFTWARE FILE-1

Big growth in VM users is predicted

A LEADING specialist in IBM's VM/370 operating system has predicted a dramatic growth in the number of active users over the next two years.

Jim Byrne, chairman of the VM/370 user group in the UK and Eire till 1977, said the number of VM users in the UK was expected to grow from 60 to 300 in the next two years.

In the US, VM users would grow from 400 to 2,000 by the end of this year, he said, representing at last 20% of all US installations.

"A major reason for this," Byrne explained, "is the availability of the new level of IBM computers with much improved price/performance ratios, and the emphasis that IBM itself is placing on VM."

Byrne, now technical support manager, VM products, for Computer Associates, was speaking at the company's formal launch of the products in the UK.

Chief among CA's offerings for VM users is IDOS/VS, which provides conversational, time sharing facilities for DOS/VS users. Based on extensions to CMS, the software allows the DOS and CMS environments to exist concurrently in the same machine.

IDO/VS makes available interactive facilities to develop, execute and debug DOS/VS programs and fully supports all DOS/VS utilities, access methods, and compilers. One important application cited by the company is as an aid in the transition from DOS to VSI.

Available for use with the system are tools for interactive symbolic debugging of Cobol, Fortran, and Assembler, and for test data generation. These packages, Symbug and Symdata, can also be run under CMS.

Other CA software for VM/CMS includes CA-ISAM, a simulation of OS ISAM under CMS, and CA-VSORT, an implementation of OS Sort for CMS.

CA, best known for CA-Sort and CA-Earl, originally acquired its VM products through the takeover of the software products division of Standard Data Corp (CW, July 8, 1976).

The occasion was also the first anniversary of Computer Associates' UK arm, formed by the takeover of Carus (CW, March 10, 1977).

Scicon system for financial planning

THE latest bureau to introduce an interactive financial planning system for end-users is Scicon Computer Services. The company has installed Finar, a financial analysis and reporting system developed by Arlatos Business Systems (CW, August 11, 1977).

Originally implemented on DEC System 10 and PDP-11 equipment, Finar has been converted by Scicon for use on the Univac 1100 series. This version will be sold and supported by Scicon for in-house machines in addition to being available on the Milton Keynes bureau service.

Claimed to be accessible to any user who can operate a desk calculator, Finar covers requirements such as the evaluation of alternative investment plans, budget variance analysis, sensitivity analysis, and profit and loss statements.

Scicon says that it plans to interface Finar with a number of existing packages to create an integrated management tool. Software identified includes packages for forecasting, project control and evaluation.

Finar has already been installed by two DEC bureaux: Allen Computer Services, of London and Datacall, of Leeds.

Coral compiler

A RESIDENT Coral 66 compiler for the DEC PDP-11 has been produced by Systems Designers. Based on the company's universal front-end, the initial version is intended for 11/34 and 11/40 equipment under RSX-11M.

Systems Designers claim support and complete portability, based on the official standard, as the major advantages over the compilers already available. The software is priced at £4,500.

Space package from Spa

A GENERAL accounting package, called Space, is available for IBM System 32, System 34 and System 3 computers from Spa Software Services. Written in RPG 2, the package handles order entry, invoicing, sales ledger, sales analysis, stock control, sales forecasting, and commission reporting. Spa Software Services is based at Thorn Villa, Thorn Way, Long Itchington, Rugby. Tel: 0926-81 2237.

NEW structural mechanics programs are included in the revised catalogue of finite element computer programs produced by Linköping Institute of Technology, Sweden. The catalogue describes program characteristics and source for about 450 programs.

Updated at the same time is the similar catalogue of pre- and postprocessor programs.

FOLLOWING the takeover of Atkins Computing Services by On-line Systems Inc (CW, August 4, 1977), the company has changed its name to Atkins On-line Ltd and plans a major expansion of computing resources. In addition to a satellite link to On-line's Pittsburgh complex, two DECsystem 10s have been ordered for the Epsom bureau, complementing the existing Xerox Sigma 9 service.

The new equipment will be used in part to make available the successful US software packages, Oscar for project management, and Oliver, a database management system (CW, January 20, 1976).

SOFTWARE FILE-2

EDITED BY PETER HEWITT

EDOS/VS version launched

A VS version of the EDOS operating system is to be released shortly in the UK by The Computer Software Company. Based on release 34 of IBM's DOS/VS, the system will be available to both System/360 and System/370 users.

EDOS/VS follows the pattern established by EDOS in providing both performance improvements and superior operational facilities over the standard IBM software. Incorporating all the enhancements of EDOS, it is fully compatible with existing DOS/VS and EDOS programs and JCL.

One factor contributing to efficient memory management in EDOS/VS is that variable partitions are supported, whose size is established at each job step. Up to 12 partitions can be run, with automatic partition balancing.

Another throughput feature is real storage system support. Typical of the architectural tailoring in EDOS/VS, this enhancement is based on the observation that, even under the VIRTUAL=REAL option, DOS/VS continues to invoke channel program translation as if it were paging.

According to the company, by-passing these routines can save up to 20% of the supervisor overhead when all partitions are being executed in real mode.

Another major bottleneck, multiple outstanding reads to the system console, is eliminated with a facility permitting asynchronous operator communication. Support is also provided for use of a 3270 as the system console.

Other features of the software include extended procedure library support and automatic IPL procedures, allowing standard system IPL statements to be catalogued.

On a 360, one of the major attractions of the system is support for program products and devices otherwise only available on a 370. EDOS/VS-360 differs from EDOS/VS-370 only in the removal of paging code.

Installations with both 360 and 370 equipment can thus use EDOS/VS as a single compatible operating system, enabling jobs to be run on either machine. The system in addition supports the company's Gemini software, which enables CPUs to be coupled.

EDOS/VS also supports the full range of existing EDOS options which include disc space management and tape management systems; the PDMS program development and maintenance system; Extended RJE; the Datacom/DB database management system; and a data entry control system, DECS.

● **Previously offering support based on the US, The Computer Software Co has now established a permanent address in the UK. The company is based at St Alphage House, 2 Fore Street, London EC2. Tel: 638-2144.**

Enhancements to Total

PORTABILITY, performance, and support for online working are the main areas enhanced by Cincom in the latest IBM 370 release of Total, numbered 8.0. Released at the same time was an interactive query facility, T-ask, the first of a projected range of end-user oriented software.

Most of the enhancements in the new Total version relate to the control of tasks and the environment, and file control, with only a slight effect on data manipulation.

The result of a major internal re-design, the chief benefits for users are a substantial improvement in throughput and response time, and a greatly superior recovery mechanism.

Fully re-entrant, Total 8.0 supports multi-task, multi-threading operation within the DBMS itself, permitting maximum I/O overlap, blocked logging, and a significant reduction in CPU cycles. Other factors lending to improved performances are execution-time element binding, and code-directed and data-directed access.

Previously restricted to BDAM, the new system for the first time offers the option of VSAM support. Including support for the key sequence version, the option facilitates the implementation of inverted file structures.

Other features of the new release include task-level recovery and a high degree of portability across operating systems; system components are now identical for DOS and OS.

[illegible] available with the Harris minicomputer implementation, T-ask provides three basic functions: query, procedure cataloguing, and directory maintenance. An interpretive processor, it is operated from a 3270 or 3270-compatible terminal.

On signing on and supplying a password, the user is presented with a menu of the database elements available to him. Those selected as germane to the query will appear on the final display, together with any derived fields such as averages or totals.

T-ask then asks the user to specify the selection criteria, and any derived fields, using the system language. When executed, the routines present results on the screen one page at a time, with the option to continue or abandon the retrieval at the end of each display.

The directory maintenance function allows the system administrator to specify which database items can be accessed by each user. Data items on each menu transcend file boundaries and can be named differently for each user. A central directory relates these aliases to the Total DBGEN name for the element.

Two more companies switch support to Pascal

FURTHER confirmation of the emergence of Pascal as a significant language and a call from Grace Hopper for users to insist on better software standardisation were software highlights at the National Computing Conference at Anaheim.

Texas Instruments has introduced a Pascal system for its 990/9900 minis and micros and the new Basic Timesharing BTI 8000 large scale system also has Pascal as an intrinsic part of its software capability.

Bernie List, US manager of Texas Instruments MOS operations, said that he believed Pascal promised to improve programmers and machine efficiency significantly and could lead to reduced software development cycles. TI is now using Pascal for its own software development.

List was talking during the conference session in which Bob Heikes, of Motorola, said that software would be the major barrier to increased growth among semiconductor manufacturers (see page 8).

A floppy disc version of TI Pascal costs $500 and a disc version $700 and a UK spokesman confirmed that the software would be launched here in the next few weeks, though prices had not yet been determined.

Captain Hopper reiterated her plea for users to insist on the implementation of standards in the course of a session on the current state of Cobol (page 1).

"It is high time consumers took a more active part in supporting good programming standards," she said. "Until that happens there will never be a development of full and coherent standards."

IBM applications system for 5110 machines

FIELD-DEVELOPED applications-oriented software is to be made available by IBM for the 5110 desk-top computer. The package, Business Report/Application Development System (Brads), is described as a database entry and maintenance system designed to help in the development of common commercial applications.

Brads provides facilities both for reporting and data manipulation. Driven interactively, the system guides the user through complete command entry by prompting for the parameter specifications required by each command.

The built-in report program caters both for automatic and user-specified formatting, reflecting a general concern in the package to meet the needs both of the casual and the more experienced user.

Features of the report generator include the ability to handle multiple input and output files, and to select on multiple user-defined criteria, such as intermediate results. Files can be accessed directly, via record number or key, as well as sequentially or indexed-sequentially.

During the report cycle, input files may be updated and output files created. Reporting facilities, under automatic printer and page control, include up to file levels of control break summaries, with automatic subtotalling, totalling and averages.

An interesting feature of Brads is that it employs a central library of file definitions. Acting as a data directory, the library describes each field of each data file and also allows any number of different logical views of each physical file.

Thus, files do not have to be defined in application programs and programs can be independent of the physical file format and attributes. In support, multiple indexes can be maintained for a file, and files can also be accessed in "Address Out" sorting sequence.

Application programmers writing in Basic can use Brads' access methods to manipulate records in such files logically, eliminating the need for Basic I/O and FORMAT statements. The system provides macros to OPEN a file, INPUT a record, or OUTPUT a record.

In addition to the report program and file access methods, the software offers general purpose functions for access to the database; an inquiry facility; and facilities for data entry and update.

Written in Basic, Brads is scheduled for release at the end of September. It will rent for £34 per month.

Offered in the US with a wide range of standard business packages, the 5110 was released in the UK without the benefit of any IBM applications software (CW, January 26). However, a number of software houses have found the system very attractive and those already offering packages include CAP, CRL-Abacus, and Eurologic Software.

Inquire database system installed in UK bureau

THE Inquire database management system has been made available at a UK bureau.

The IBM-based UK arm of Control Data Corporation Data Services Division has installed the DBMS software on its 360/65 running under MVT. Now that field trials have been successfully completed the bureau expects several clients will soon be using Inquire.

Inquire originates from Infodata Systems of Virginia, but is marketed in the UK by London consultancy Software Implementation. Despite having had the agency for two years, this is the first site supplied by Software Implementation.

The system has several unusual features, including an English-like query language and facilities for text processing.

Inquire can support hierarchical, network, and relational databases. A special feature allows two files to be temporarily associated and treated as one, by identifying to Inquire a field common to both — a useful restructuring facility.

Among 85 Inquire users worldwide are two UK users supplied before the agency agreement with Software Implementation.

هكذا من الأصل

PROGRAMMER NOTES

De Bono's views on Lateral Thinking

THERE is an enormous conceptual poverty within the DP world. And, according to Edward de Bono, it represents a far greater deficiency than within any other occupation.

De Bono, the father of Lateral Thinking, was expounding his views at a three-day seminar organised by Infotech. Object of the sessions was to stimulate DP people into extending their normal techniques of problem solving.

According to de Bono, part of the difficulty for DP people is that there is usually at least one obvious solution to a problem — probably of a conventional processing type.

Lateral Thinking should be used as a stepping stone to new ideas, to kick away from well-worn channels of thought. A means of introducing external influences, it can sometimes bring out important insights, leading to new techniques.

De Bono does not advocate expending too much time and effort on Lateral Thinking approaches. He recommends its regular application, but in moderate periods of perhaps 10 minutes. Thereafter if LT has not suggested any new possibilities, conventional methods should be adopted.

Applying the techniques of Lateral Thinking will never be easy, de Bono says, because the idea is to break established habits. DP teaches its disciples to tackle a problem at the technical grass roots, whereas LT encourages a broader view.

When an impasse has been reached, half the battle is won when the programmer or analyst admits the existence of the blockage, says de Bono.

One tactic that can then be adopted is random juxtaposition: take a word, object, or analogy at random and think of it in conjunction with the problem. For example, what relationship could there be between a paper-tape and traffic lights? Perhaps a shading of green through amber to red could be used to indicate the amount of tape left on a reel.

Another technique is to start at the end of a problem, or to tackle a side issue first, before working back to the mainline.

De Bono also emphasises the significance of problem finding. This involves examining a topic from several points of view, looking for potential enhancements. The aim here is to identify benefits, without regard to the practical mechanisms necessary to achieve them.

A typical starting point here might be the observation that much effort is wasted on printing legible characters on coding forms, time that could be spent more productively if alternative means of input were available.

Next week Programmer Notes will examine de Bono's other techniques, but in the meantime, readers who have experimented with Lateral Thinking are invited to write to Programmer Notes to air their views. Please include a day-time phone number if possible.

Puzzler

FIND the smallest set of three different numbers, such that the three possible square-pair totals $(A_2 + B_2)$, $(A_2 + C_2)$ and $(B_2 + C_2)$ are all perfect squares. 140-480-693 is such a set, but much lower numbers are possible. (By "smallest" is meant the lowest possible A + B + C total.) See page 53 for solution.

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National Computer Conference — Anaheim

Senator Hollings

WITH 108 sessions and over 500 speakers, the NCC conference could not be criticised on grounds of quantity. But its very size tended to confuse rather than elucidate.

The overall theme attempting to tie it all together was computers and energy. But many of the speakers, such as the keynote speaker Senator Fritz Hollings, brought in energy almost as an afterthought.

In his speech that was full of colourful nationalism and praise of the free enterprise system, Senator Hollings stressed that information technology was of vital importance to the nation — and so was energy.

Industry at crossroads

Another major speaker on the "energy" theme was Pertec chairman Ryal Poppa. But he really spoke about the personal computer market (see below) and merely referred in passing to the way personal computers could be used in energy conservation applications.

In fact, the real theme to emerge from the sprawl of papers was that the computer and semiconductor industries were merging together into a unique synthesis — the outcome of which is unpredictable, except to say that "You ain't seen nothing yet." Bob Heikes of Motorola said that the new emergent technology would be created by a "unique juxtaposition of computers and semiconductor technologies and we should beware of taking a strictly semiconductor approach or a classical computer science view."

Les Hogan, vice-chairman of Fairchild, pointed out that the semiconductor industry has moved out of the era of supplying discrete components to computer manufacturers and has reached a point where the semiconductor "components" have become the heart of the system.

"There must be more of a feedback from the architectural designers to the chip manufacturers," he said and looked to architectures incorporating multi-processors and functional processors as examples of future trends. But he pointed out that "the trick will be to find a way of mass producing these systems so that they can be sold like popcorn."

On an optimistic note, he concluded: "We are about to write the most exciting chapter the two industries have written — and we must do it together for the needs of the future will not be met separately."

Japanese attack in the spotlight

THE Japanese attack on the US mainframe manufacturers and its technological advances in integrated circuit manufacture were highlighted when for the first time at NCC, a series of sessions were devoted to recent developments in the Japanese computer industry.

Latest techniques in LSI and VLSI integrated circuit manufacture were discussed, and details were given of the now 128K-bit ROM which is being sampled at the electronic communications laboratories of the public sector Japanese PTT Nippon Telephone and Telegraph. The device was said to have an access time of 200 nanoseconds, to be 20.6 square millimetres in area and to have a power consumption of 65 milliwatts.

The need for such a device is dictated by the Kanji character set which is the only one in which unambiguous Japanese can be written. Some 2,000 different Kanji characters are required for everyday usage, but four of the new chips can store 1,820 different characters, and they will be an important feature of the planned Japanese viewdata system.

The success of the three major groupings of manufacturers in developing ranges of mainframes to compete with IBM's 370 line was discussed and it noted that Nippon Electric's Acos 77/900 system, which is similar to the 66/85 project that Honeywell aborted, offers two to three times the power of IBM's 370/168. It comes with up to four CPUs, offers up to 16 Megabytes of main memory and up to 18 channels with a transfer rate of 60 Megabytes per second.

The machine is based on Honeywell Level 66 licences, and the circuit chips currently have the highest gate density, up to 200 gates per chip.

Software seen as a block on semiconductor growth

SOFTWARE could be the major limit to the growth of the semiconductor industry and this "intolerable situation" will be overcome by semiconductor manufacturers insisting on improved software engineering techniques.

That message, summarised in an electric speech by Bob Heikes, assistant general manager of semiconductors at Motorola, was the unchallenged conclusion of an NCC session on the impact of semiconductors on computer architecture, chaired by semiconductor pioneer Dr Gordon Moore, president of Intel.

Dr Moore gave birth in the mid-Sixties to what are known as Moore's laws, defining the relationship between lower prices and increased complexity of chips — getting "moore and moore (sic) for less and less" as Heikes quipped.

This trend, said Moore, had reached the point where "we are no longer limited by the art of the possible but by our ability to define and design the applications to which we wish to put the systems to use."

Heikes emphasised this point by saying: "Hardware progress is so rapid that a major worry is that our customers cannot effectively use the systems."

But his most stringent words were addressed to the software business. "The irrestible force of VLSI," he said, "is meeting the immovable object of software." The "laws of survival" for the semiconductor industry demand reduced prices and this in turn required "prodigious production," he said. For example, by 1980 more microcomputers will be produced per day than the entire minicomputer production per year at present.

Low costs and high productivity have been the hardware key, he stressed. By contrast, software has been characterised by high costs and low productivity.

Heikes quoted a figure of $10 per line and 10 lines per man day as typical figures for software development. The aim, he said, should be a cost goal of five cents per line.

"The plain truth is that it is now vital that all software must be designed with reference to software engineering techniques," he went on.

"By its nature, software design in the past has failed to deliver correct systems. Designers often move straight into code, with the system going live when only 80% correct. Then, when modifications are made, they often create more problems than they solve."

Microcomputer designers regard this situation as intolerable and will insist on improvement in the future.

This could lead to more "software in silicon" firmware with, by 1990, complete microcomputers on a ship operating at up to 20 million instructions per second and including system software.

But in the longer term he believed that mass produced complete systems will become feasible only through the use of advanced artificial intelligence techniques.

The real importance to semiconductor manufacturers of software was illustrated by Bernie List, manager of MOS operations for Texas Instruments. Before the 1970s, he said, software formed a small part of the semiconductor manufacturer's costs. Now, however, software is about 20% of the costs and soon it could be over 50%.

Hobbyist market due for 'shakeout' soon says Pertec chairman

THE growing markets in the personal computer field will be for small business and home management systems, but there could be a significant "shakeout" in the hobbyist market in the very near future, according to Ryal Poppa, chairman of Pertec Computer Corporation.

Speaking at the NCC personal computing luncheon, Poppa said "the bloom is off the rose" in the hobbyist and what he called "home-use personal computing" markets.

Ryal Poppa

He distinguished between the application of computers in the home for purely personal use, compared to use in household management, for example, in environment control or, as in a case cited by Poppa, where a Catholic teaching brother is using a small computer to maintain an inventory on his 900 brothers.

The home management type of application, he said, was very similar to a business application, so Poppa defined the nature of a system by its application rather than whether it was used at home or in business.

"Personal computer" small business systems are already a multi-billion dollar market, he said and he predicted that the home management market would reach the same scale by the late 1980s. He believed, however, the hobbyist market was saturated and had too many companies.

Entry into the market, he pointed out, had been too easy and he estimated there were currently over 750 companies in the fields, including IBM with its 5110 which is already being sold through IBM computer stores in the US. By the early Eighties, however, he believed the number would be only about 50.

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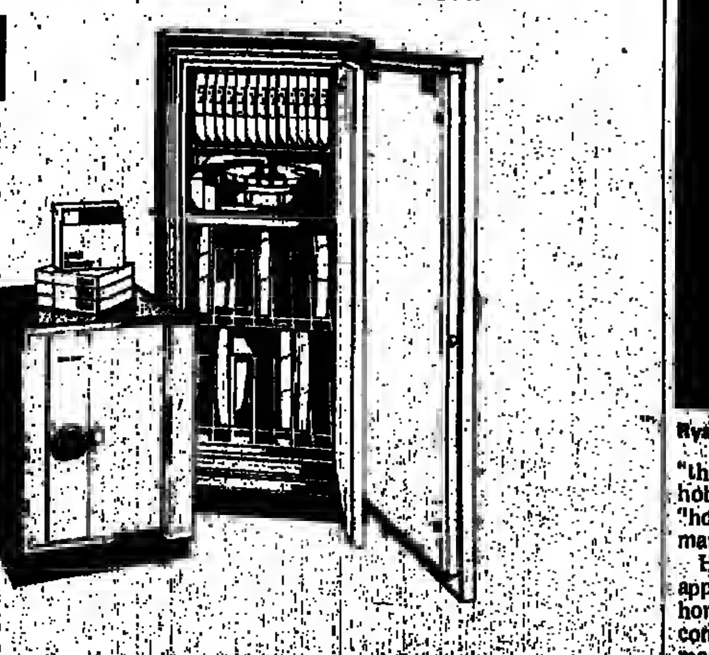

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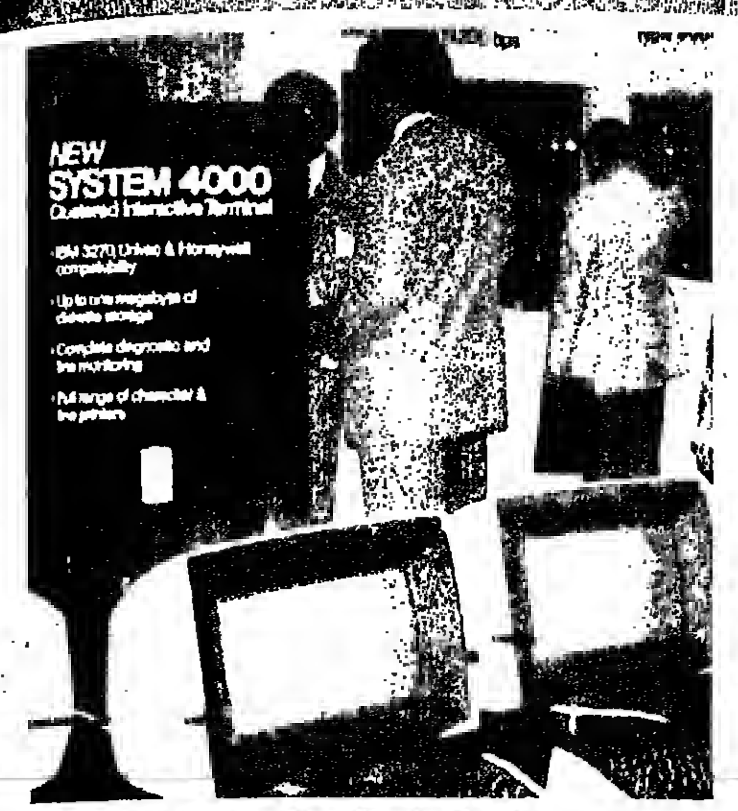
Reports by Malcolm Peltu and Tim Palmer



Cluster terminal debut

DUE to be announced in Europe later this year, the new Racal-Milgo System 4000 cluster terminal system for IBM, Univac and Honeywell users is seen above making its debut at NCC. Fully compatible with IBM's 3278 cluster, the System 4000 includes microprocessor driven systems controller, two alternative communications controllers and a mass storage controller which supports up to one Megabyte of floppy disc storage.

Up to eight terminals can be supported, and the communication protocols available or under development include IBM 3277, 3271 and 2280; Univac UTB 400 and Honeywell VIP 7760.

Keeping faith with the users

NEW products making use of bit-slice microprocessors were introduced at the NCC by Jacquard and Harris. While Harris chose the popular AMD 2901 for its new S550 and S570 large-scale computer systems, Jacquard has adopted the Texas Instruments TI 281 4-bit slice microprocessor for its powerful 16-bit J500 desk-top computer. Both companies have kept faith with existing users by retaining full software compatibility with the rest of their lines.

The Jacquard J500 runs 25 times faster than the company's J50 terminal computer, and is designed to run all the software available on the J100 multi-terminal system. In particular, the word processing software package is being emphasised, which makes full use of about 30 programmable function keys. It incorporates two double density floppy disc drives from Shugart in the desk-top unit, together with large screen and keyboard, and will also support cartridge discs. Biggest breakthrough is in the price, with the basic unit selling for $9,200, compared with about $14,000 for the J50.

Harris Computer Systems introduced the first two members of its Series 500 family, the S550 and 570. The new processor features the standard Harris 24-bit word, but the central system bus is 48 bits wide. An 80 nanosecond 2K-word cache has been added to speed up operation.

Where program size is limited to about 64K-bytes on the S100 series, it is unlimited on the S500. Software compatibility with the S100 line is maintained when the machine is run in compatibility mode, but there is also a native mode.

EXHIBITION BITS

Booming business

COMPUTER business in the US is booming as never before, judging by the response to the packed exhibit arena at Anaheim.

IBM had a mainframe at an exhibition for the first time in several years, and revealed to the world that the new 3031 is painted not traditional blue but red. But Itel, with its 3031 look-alike AS/5, stuck to the traditional IBM colour scheme. IBM's exhibit also featured the new 5110 desk-top computer, reported to be sold out for the next nine months.

The Japanese were represented in greater strength than ever, with Nippon Electric, Fujitsu and Hitachi all selling OEM peripherals. Siemens is also expanding its OEM activity, and the ND-2 laser printer was shown on both the Siemens and Itel stands.

COMING into the show at the last minute, Digital Equipment was one of several unfortunate exhibitors relegated to emergency exhibition space in the garage. Unfortunate because the air conditioning worked only intermittently and for most part the atmosphere was hot, sticky and unpleasant. DEC was in good company. NCR, which offered an antique cash register as a contest prize, Univac, Fairchild and Motorola, all had space in the garage.

DEC, however, had the perfect publicity antidote to the garage atmosphere. Two light planes, flying in formation, patrolled the Anaheim skies trailing streamers declaring that the "DECsystem 2020" was the "world's smallest mainframe".

ANOTHER advanced device that can be attached to a microprocessor through the S-100 bus is the CAT-100 video processing system from Digital Graphics Systems of Palo Alto, California. A prototype system was developed just in time for the NCC. It accepts video input and digitises it one frame at a time. A basic system, with 32K bytes of random access memory is offered as a complete package for $1,275.

Bigger than ever

WITH over 50,000 visitors in the first three days and queues forming again on the fourth day, the NCC is in danger of becoming too big. According to Cuthbert Hurd, one of the NCC co-chairmen, there are now only three venues in the US that can stage the event — Anaheim, New York and Dallas. The NCC in 1979 is planned for New York, but there was growing talk that the event might soon be split into separate east and west coast events.

British exhibitors well satisfied

UNANIMOUS satisfaction was expressed by British exhibitors as NCC closed on Thursday.

Rair Microcomputers attracted plenty of attention for its Black Box microcomputer and planned to return next year. Lynwood Scientific was also set to return, saying that it exhibited its micro-controlled display terminals mainly to make contact with possible US maintenance organisations.

Grundy and Partners was overwhelmed with inquiries about its new approach to data entry: the Truadata terminal consisting of 256 light emitting diodes addressed by light pen. The user generates his own masks which can be anything from a parts explosion of an engine to a survey map, and the terminal responds to inquiries made with the light pen on part numbers, prices or other data.

The fact that the Truadata backing computer was damaged in transit so that when it was first switched on one of the integrated circuits burned right through its package dampened visitor enthusiasm not at all.

Case took place to make the first US presentation of the MSX message switching system which now represents some 50 per cent of the company's business. It is operating out of Insac's US office at present; and has not yet decided whether to sign US distributors or go it alone.

MSP reported that inquiries about its Datamanager and other software products for large IBM users exceeded the 1977 NCC total on the first day and by the end of the show it had taken some 300. Definitely returning in 1978, the company noted that some NCC visitors had come specifically to look for software.

Micro Focus, with its micro-resident and Cobol 74 compatible CIS Cobol systems (see front page) attracted at least 20 firm inquiries and a great deal of enthusiastic interest on its stand in the Personal Computer Fair.

CAP-CPP Inc was represented on the Mostek stand, a company which has just adopted CAP's MicroCobol as the first fully-supported high-level language on its Z80-based boards for systems builders. It says that the first attraction of the CAP product is that it demonstrably works and runs on Mostek's hardware.

Sintrom, looking for OEM customers for its D-300 tape cartridge drives and formatters and its intelligent plotter controller, claimed a fair measure of success, adding that it may have to manufacture in the US to reach the end-user market.

Newbury Laboratories, too, is considering licensing a US company to manufacture its display terminals.

A unique opportunity to assess the latest American Computers and Peripherals

You are cordially invited to visit the US Trade Centre, during the week of June 19-23. Assess and investigate the latest American Computers and Peripherals at a major exhibition to be held at the United States Trade Centre, 4/5 Langham Place, London W1.
The exhibition will include exhibits of the latest advances in Computers and Peripherals from some fifty leading American manufacturers in the field.

Refer to this special preview for outline information on the exhibitors and their products. Entrance is free to readers of Computer Weekly — just register at the door.

PARTIAL LISTING OF EXHIBITORS AND THEIR PRODUCTS

Advanced Electronics Design Inc. will be exhibiting Magnetic Disc Systems, Floppy Disc Systems, Floppy Discettes, Cartridges Disc and Disc Packs. *UK Representative* Dicoll Electronics Ltd, Basingstoke, Hants. Tel (0256) 81551

Amcomp, Inc. will be featuring Magnetic Tape Drives and Discs. *UK Representative* I S.D. Data Sales Ltd, Maidenhead, Berks. Tel (0628) 36828

Anderson Jacobson, Inc. will be displaying Printer/Plotter Terminals, AJ211 Acoustic Couplers, Dot-Matrix Terminals. *UK Representative* Anderson Jacobson Ltd, Shepperton, Middx. Tel (09322) 44438

Atlantic Research Corp will be showing Line Protocol Analysers with Imarkey, Stand Alone Monitors, Bulk Data Recorders, Asynchronous Data Test Systems, Interface Patching Systems, Remote Control Switching Systems and Terminal Testers. *UK Representative* Borer Data Systems Ltd, Wokingham, Berks. Tel (0734) 783372

Clifton Precision, Litton Systems, Inc. will be demonstrating Servomotors, Tachometers, Encoders, Stepper Motors. *UK Representative* Litton Precision Products International, Inc., Slough, Berks. Tel (0753) 28287

Data 100 Corp. will have on display Remote Printers, Matrix Printers, Card Readers and Magnetic Tape Cartridge Transport. *UK Representative* Data 100 Systems Ltd, Hemel Hempstead, Herts. Tel (0442) 41141

Datamedia Corp. will be featuring Video Terminals plus Keyboards and Minicomputers. *UK Representative* Mellordale Ltd, Colchester, Essex. Tel (020629) 8151

Dataproducts Corp. will be demonstrating Line Printers. *UK Representative* Sintrom Electronics Ltd, Reading, Berks. Tel (0734) 85464

Dataram Corp. will be showing Core Memories. *UK Representative* Sintrom Electronics Ltd, Reading, Berks. Tel (0734) 85464

Data Systems Design, Inc. will be exhibiting Floppy Disc Systems. *UK Representative* Data Design Techniques, Boreham Wood, Herts. Tel. 01-207 1717

Delta Data Systems Corp. will be showing Video Terminal Cluster Systems, User Programmable Video Display Systems and Text Process Video Display Terminals. *UK Subsidiary* Delta Data Systems Ltd, Welwyn Garden City, Herts. Tel (96) 33833

Diablo Systems will be featuring High Speed Printing Terminals and Print Wheels. *UK Representative* Zygal Dynamics Ltd, Chesham, Bucks. Tel (02405) 7668)

Di-an Controls, Inc. will be demonstrating Terminal Printers and Ticket Printers. *UK Representative* Data Design Techniques, Boreham Wood, Herts. Tel 01-207 1712

Digicom, Inc. will be showing Floppy Disc Systems. *UK Representative* Data Design Techniques, Boreham Wood, Herts. Tel 01-207 1717

Digital Equip. Corp. will feature Micro Computers. *UK Distributors* Dicoll Electronics Ltd, Basingstoke, Hants. Tel. (0256) 5155) Peripheral Hardware Ltd, West Molesey, Surrey. Tel. 01-941 4806

Digital Pathways, Inc. will be exhibiting Digital Calendar Clocks and PROM Memory Systems. *UK Representative* Dicoll Electronics Ltd, Basingstoke, Hants. Tel (0256) 51551

Digilek Lamanna Corp. will be demonstrating a Paper Tape Reader and Punch Terminals. *UK Representative* Peripheral Hardware Ltd, West Molesey, Surrey. Tel 01-941 4806

E E C O will be showing Paper Tape Readers and Paper Tape Punches. *UK Representative* Dicoll Electronics Ltd, Basingstoke, Hants. Tel (0256) 81551

Floating Point Systems, Inc. will be exhibiting Floating-Point Array Processors. *UK Representative* Floating Point Systems SA Ltd, Reading, Berks. Tel (0734) 50181

Futuredata Computer Corp. will be showing Microcomputer Support Systems. *UK Representative* I S G Data Sales Ltd, Maidenhead, Berks. Tel (0628) 38528

G.T.C.O. Corp. will have on display Data Tablet/Grid Digitizer, CRT Terminals and Data Cartridge Storage. *UK Representative* Tochex Ltd, Bournemouth, Dorset. Tel (0202) 293115

General Electric will be demonstrating Terminal/Line Printers, Printer Terminals, Line Printers and Magnetic Tape Terminals. *UK Representative* DNT Automatic (UK) Ltd, Slough, Bucks. Tel (75) 21298

General Robotics Corp. will be featuring Micro Computers, Desk Top Computers and Hydra Printers. *UK Representative* Gemma Telecommunications Systems Ltd, Wokingham, Berks. Tel (0734) 784541

Grinnell Systems Corp. will be demonstrating Graphic Display Systems. *UK Representative* Tochex Ltd, Bournemouth, Dorset. Tel (0202) 293115

Hewlett-Packard will be showing Graphics Display Terminals, Display Terminals and Printing Terminal with Keyboard. *UK Representative* Hewlett-Packard Ltd, Wokingham, Berks. Tel (0734) 784774

Houston Instruments Inc. will have printers on display. *UK Representative* Sintrom Electronics Ltd, Reading, Berks. Tel (0734) 85464

Informer International, Inc. will feature Terminal Control Units and Visual Display Computer Terminals. *UK Representative* Dessel Audio and Data Communications Ltd, Tring, Herts. Tel (044 282) 4011

Infotron Systems Corp. will be displaying Port Selectors, Data Multiplexers and demonstrating Test Equipment for Modems, Multiplexers and Terminals. *UK Representative* Infotron Systems Ltd, Dorchester, Dorset. Tel (0305) 68015

Integrated Computer Systems, Inc. will be explaining the benefit of their Educational Courses on Digital Image Processing, Pattern Recognition and Analysis, Radar Signal and System Simulation Techniques, Distributed Processing and Computer Networks and Microprocessors. *UK Representative* Integrated Computer Systems Publishing Co, Gough Way, Cambridge. Tel (0223) 69430

Intel Corp. will have Microprocessors on display. *UK Representative* Sintrom Electronics Ltd, Reading, Berks. Tel. (0734) 85464

Kennedy Co. will be featuring Tape Transports. *UK Representative* Sintrom Electronics Ltd, Reading, Berks. Tel (0734) 85454

Lear Siegler Inc. will be showing Visual Display Units. *UK Representatives* Peripheral Hardware Ltd, West Molesey, Surrey. Tel. 01-941 4805; Gemma Telecommunications Systems Ltd, Wokingham, Berks. Tel. (0734) 784041

Modular Computer Systems, Inc. will be introducing 'Classic' Computer Systems, first time showing in the UK, Visual Display Units, Graphic Display Units and Teletypewriters. *UK Representative* Modcomp UK, Wokingham, Berks. Tel. (0734) 791179

Nashua Corp. will be demonstrating Disc Pack Storage Modules, Flexible Discs and Magnetic Tapes. *UK Representative* Nashua Computers Ltd, Bracknall, Berks. Tel (0344) 52711

Plessey Peripheral Systems, Inc. will be exhibiting Add-on Memories and Peripherals. *UK Subsidiary* Plessey Peripheral Ltd, Brackmills, Northants. Tel (0604) 52175

Sci Corp will be featuring Rotary Printers. *UK Representative* Peripheral Hardware Ltd, West Molesey, Surrey. Tel 01-941 4806

Spectron Corp. will be showing Datascopes, High speed Tape Units, S.D.T.S. and Digital/Switch and Patch Equipment. *UK Representative* General Audio and Data Communications Ltd, Tring, Herts. Tel (044 282) 4011

Storage Technology Corp. will be exhibiting Disc Drive, Disc Control Units, Tape Control Units, Tape Units, Formatter/Controller and Tape Transport Units. *European Office* S T C S A, 78310 Maurepas, France. *UK Subsidiary* Storage Data Technology, Kensington, London. Tel 01-937 9835

Sweda International, Inc. will be displaying Desktop Reader/Punch and Punch Magic Mechanisms. *European Office* Sweda International, Inc, Rue de Tocqueville, 75017 Paris, France. *UK Representative* Adler Business Systems Ltd, Croydon, Surrey. Tel 01-686 5344

Tally Corp. will be featuring Teleprinters, Lineprinters, Disc and CRT Monitors. *UK Subsidiary* Tally Ltd, Reading, Berks. Tel (0734) 580141

Teletype will be demonstrating their Teleprinters. *UK Representative* Peripheral Hardware Ltd, West Molesey, Surrey. Tel 01-941 4808

Varian Data Systems will be showing Printers, Plotters and Peripherals. *UK Representative* Euro Electronic Instruments Ltd, London NW1. Tel 01-282 2745

Versatec Inc. will be exhibiting Electrostatic Printer/Plotters, Off-line Vector Processors, Electrostatic Plotters and Off-line Raster Processors. *UK Representative* Versatec Ltd, Newbury, Berks. Tel (0635) 42421

Video Terminal Technology, Inc. will have on display Video Computer Terminals. *UK Representative* Techex Ltd, Bournemouth, Dorset. Tel (0202) 293115

Western Telematic, Inc. will be displaying Flexible Disc Store and Edit Terminals. *UK Representative* Zygal Dynamics Ltd, Chesham, Bucks. Tel (02405) 76681

Zentec will be showing Micro Computer Terminal Systems. *UK Representative* Zygal Dynamics Ltd, Chesham, Bucks. Tel (02405) 75551

The exhibition, **Computers/Peripherals** is open Monday, 19 June, 12.30pm-5.30pm and from Tuesday, 20 June to Friday, 23 June from 9.30am-5.30pm.

Free tickets are available to bona fide businessmen by phoning the **United States Trade Centre 4/5 Langham Place London W1 on 01-637 0581**

PEOPLE

Sir Rex appointed to the IBM board

Sir Rex Richards

THE vice-chancellor of Oxford University and Warden of Merton College, Sir Rex Richards (left), has been appointed to the boards of IBM UK Holdings and IBM UK.

A distinguished scientist, Sir Rex was knighted in the Silver Jubilee Honours for his work on nuclear magnetic resonance. He has been a member of the Councils of the Royal Society, the Chemistry Society and the Faraday Society.

He was made a Fellow of the Royal Society in 1959 and received the Royal Society Davy Medal in 1976. He is the first scientist to have been appointed vice-chancellor of Oxford.

Irish BETA officials

OFFICIALS of the Irish Business Equipment Trade Association, IBETA, have been elected for 1978-79. They are:

President, John Campbell, Rank Xerox (I); vice-president, Aidon McKenna, Memory Business Machines; hon secretary, Ted Cantwell, Regent Typewriter (I); hon treasurer, Lasla Johnston, Dublin Office Equipment Co; PRO, Brian Grent, IBM Ireland; administrator, Jack Simpson.

Derek Stackiston, previously central accounts senior territory manager with Redifon Computers, has joined Inforex as a senior salesman.

Davo Bennott [extreme right] **explains the workings of a CMC Key Processing System to members of Cumac, the CMC Users' Association, at the Open Day held recently at CMC's headquarters in Hamel Hampstead, Herts. (Left to right) Alan Fitch, Haven Computer Services, Nigeria; Roy McKenzie, Johnson Matthey; Ann Mask and Cumac chairmen Jack Squires, Mann Egerton; Dave Groome, Alpha Numaric; Peter Avery and Colin Edwards, Hoskyns; Cumac secretary Bobs Foster; and Mary Sicknell and Selly Stevens, Lagat and General.**

Motorbikes for charity

A 2,000-MILE Vintage Motorcycle Tour of Great Britain organised by the Electrical and Electronics Industries Benevolent Association was successfully completed on June 4.

The five machines set out from Stroud in Gloucestershire on May 27, and their route took them to John o'Groats and Land's End before finishing in Dorking in Surrey.

The event was organised to raise funds for the EEIBA through sponsorships.

Janet Lennox joins Ferranti as Western regional manager. She was previously with Leyland International where her responsibilities included management of systems programming and systems engineering support for all Leyland's European installations, evaluation and acquisition of all equipment, setting of standards for all aspects of a computer installation, defining job responsibilities and selection of senior staff, together with a functional responsibility for overseas companies.

Charles Nash, formerly Surroughs' promotion manager for the North of England and Scotland, has been appointed manager of the company's Preston branch.

Michael Toomey, formerly operations manager with UCC Datacam, has joined Memory Ireland as manager of the computer bureau payroll service division.

Keith Bishop has become a senior systems analyst with Logabax in Leeds. Previously he held a similar position with Adlor.

The South of the Thames heat of the Computeatere compadtors took plaza in brilliont sunshine last Sunday at Croydon Sports Arena. The evant had the highast attandance as far, with 28 men's and 12 ladies' teams participating. Winners of tha man's avents ware Hounslow Borough Council with 126½ points, with Commercial Union and the Rank Organisation second and third respectively. It was a notable achievement for Hounslow, since their team captain, Peter Griffin had to retire sorly in the competition with an injured knee.

The Rank Organisation won the ladies' event with 67 points, after a close contest with Parkin Elmar, who finished one point behind tham. Hounslow Borough Council were again represanterl by the ladies' individual winner, Janet Davlaan. For the mea's individual winner, Tony Osborn of Robart Horne Computer Services, it was a day for double celabrations — Sunday was also his eighteanth birthday.

The winning ladies' taam is saan above, left to right Dinne Stephens, Jonica Cook, Jackie Lsw, Diane Jonas. The winning man from Hounslaw were, left to right Garry Brannan, Dave Royston, Brian Hughes, Stava Bristow, Gnry Raod.

John Clark has become president of Itel's data products group in the US, of which he was formerly executive vice-president, and has been elected a vice-president of the parent corporation. He assumes operating responsibility for the group from Richard Lussier, executive vice-president of Itel, whose responsibilities have been extended to include the air and equipment management and the data services groups, as well as the data products and financial services groups.

Among those reporting to Clark is the president of Itel International, Joseph Fostar.

Derek Hoffmann, general manager of Kins Applied Technology, has been appointed to the board. Brian Betts has been promoted from marketing executive to marketing manager, and Gerry Hughes, lately of Foxboro-Yoxall, has joined Kins as a marketing executive on computer systems.

Paul Martin joins Logabax as a senior sales executive for the City and North London. Previously he was with Univac in a similar capacity.

Fred Fovargue, a systems analyst with Redifon Computers' Midlands branch, has been promoted to senior systems analyst, central accounts North.

David Metcalfe has joined Datran Electronics as managing director, releasing Geoff Cannell to concentrate on his role as chairman. Metcalfe was previously UK instrument group manager with Hewlett Packard.

David Snell, formerly an account manager in Honeywell's Government sector, joins Gamma Telecommunications Systems as sales manager for the Quik-Sell system. Paul Sherry, previously an account manager, commercial systems, with ICL, becomes applications manager at Gamma.

Ron Blain, formerly a sales engineer with ITT's ceramic capacitors division, has joined Buckman Instruments, also as a sales engineer.

DIARY

JUNE 19
Directional grammar. George Tapsar, RCS Natural Language Translation Group. King's College, London WC2. 15.00.

JUNE 19-20
Plug-compatible machines, conference, Online, Regent Centre Hotel, London W1.

JUNE 20-21
Meeting. IBM Series 1 Users' Association. Royal Angus Hotel, Birmingham.

JUNE 20-22
CAM 78, computer-aided manufacture conference. Department of Industry. National Engineering Lab, East Kilbride, Glasgow.

JUNE 20-23
First World Computing Services Industry Congress. ADAPSO/ECSA/JSIA. Princes Sofia Hazel, Barcelona.

JUNE 21
Think plug-compatible. Data Processing Management Association. Central London branch. CDS, Wells St, London W1. 18.00.

JUNE 26
Michael Jackson design techniques. Management tutorial. Marcus Brambarger. Dept of Computer Science, University of Strathclyde. Glasgow. 9.30. Details Mrs Christie, 041-552 4400, ext 2132.

JUNE 27.
Multi-microprocessor systems. Institution of Electrical Engineers. IEE, Savoy Place, London WC2. 10.00.

Social aspects of machine intelligence. Donald Michie. BCS 1978 Lecture Series. London School of Economics, London WC2. 16.30.

JUNE 27-30
National security and protection exhibition and conference. International Professional Security Association. Granby Halls, Leicester.

JUNE 29-30
Operations group meeting. IBM Computer Users' Association. Grand Hotel, Bristol.

JUNE 29-JULY 2
Computers and lawyers. Society for Computers and Law, Pollock Halls, University of Edinburgh. Details: Mrs D Wilson, 022-558 433.

Penta agent moves

UK AGENT for the Penta system, Miles 33, has moved to new premises in Bracknell. The address is Cary House, The Ring, Bracknell, Berks RG12 1AX, tel: 0344 56633.

Sales manager of Miles 33 is Tom Hill, who was previously sales manager of Comprite.

Liveware Saga

by Dax

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BOC Datasolve

First prize in the Computer Weekly/Dataskil essay competition, Computer-style 2000, was shared between Bryn Jones of Haverfordwast, whose essay was published last week, and David Butler (pictured right), of Butler, Cox and Partners, of London EC1. Butler's essay, entitled "Britain in Turmoil 1975-2000", appears below.

Third prize in the competition was won by John Garratt of CSI, London; and Garratt's assay, and those of the special award winners — John Finnie of Solihull, Paul Holden of Dublin, and A. Thornton of Darby — will be published soon.

By DAVID BUTLER

Britain in turmoil—with a ban on political parties and the Press censored

(This article is based upon excerpts from *A Social History of Britain in the Twentieth Century* published by the Oxford University Press in the year 2000. Copyright OUP, MM).

LOOKING back on the final quarter of the twentieth century, one is struck by two apparently contradictory phenomena. The first is the amazing rate of change — technical, social and economic which prevailed.

The second is the almost total lack of awareness of the significance of that change among the acknowledged leaders of society, including businessmen, politicians, economists and sociologists. They simply pretended that the computer revolution wasn't happening and that the Information Society (or Infosoc for short) would go away if it were ignored.

On reflection, however, these two trends were not as contradictory as they seem. For, if the political leaders of the 70s and 80s had understood Infosoc, they would probably have strangled it at birth.

Few people paid much attention to even the most fundamental changes, such as patterns of employment. In 1952, for example, 43 per cent of the British workforce worked in manufacturing and only 38 per cent in services. Twenty years later manufacturing accounted for only 37 per cent while services had grown to 49 per cent. As manufacturing declined, unemployment had reached three million. A confidential Treasury forecast of five million unemployed by 1983 was leaked to the Press and the ugly and virulent Wurk Riots broke out in 1981. In the course of three months over 1,000 lives were lost, including rioters, police and troops.

After the signing of the famous Birmingham Declaration by the representatives of the unemployed (now representing an important constituency of nearly 10 million people including families and dependents), the police, the armed forces and the trade unions, the inevitable consequences followed. Under the Emergency Powers Act (1982) a Government of National Reconstruction was appointed for an indefinite period. Political parties were banned and strict Press and media censorship imposed. With few exceptions the people of Britain heaved a sigh of relief and began work on the construction of Infosoc, a task for which Britain was in fact uniquely well qualified.

It had been clear for some years that the British people had a clearer perception of their future than their leaders. As long ago as 1978, the Government of the day had bought an order for ships (at a loss) from the Polish Government, to try to preserve jobs in an obsolete shipyard. The workers themselves declined this subsidised make-work scheme, as if sensing its inherent economic folly. The trend for the workers themselves to take the lead in closing down obsolete plants thus became known as "Swan Hunterism".

But the decline in factory headcounts was a global trend. In countries where conventional engineering had persisted longer such as the US, Japan, Canada, France and Germany the decline of factory employment left behind huge pools of labour in the 1980s. By 1990, Britain had a big advantage because it had begun its shake-out more than a decade earlier. Factory automation exploded in the newly-rich countries of China, Brazil, Saudi Arabia, Iran and The United States of Africa, where the absence of a workforce dependent on conventional factory employment caused the introduction of totally automated factories.

> *The trend for the workers themselves to take the lead in closing down obsolete plants thus became known as "Swan Hunterism".*

The most obvious sign of industrial change in Britain was the rapid and drastic decline of manufacturing. Solidly resistant to change, wracked by internal dissension and apparently indifferent to the threat of its competitors, the UK manufacturing sector slid painfully downhill.

In the 1980s and 1970s manifestations of this decline included the nationalisation of virtually every strategic manufacturing industry — aircraft, steel, motor cars, ships and space. Unprofitable companies were subsidised (consuming virtually all the revenues from Britain's short-lived oil industry) in a vain attempt to save employment.

By 1990, however, the level of understood that the insistence upon a full-time job was characteristic of an unenlightened, unreconstructed personality.

> *By 1985, it was clearly understood that the insistance of a full-time job was characteristic of an unenlightened, unreconstructed personality.*

Gradually Infosoc emerged, painstakingly built on the self-sacrifice of a generation trained for work that no longer existed. Many of today's largest industries did not exist a quarter-century ago. Global resource management was in its infancy: today British systems corporations look after the conservation of 70 per cent of the world's consumable resources. They monitor pollution in 12 of the world's 15 largest industrial nations.

In 1975, public entertainment consisted of TV, two-dimensional films and performances by live "stars". Today's holographic and polyphonic fantasy factories, shipping their spectacular multi-media products to every country in the world, were undreamt of. Britain supplies over 40 per cent of the fantasy output of the world.

While countries with a less developed regard for human life have specialised in manned space exploration, the UK has pioneered the development of telecheiric lunar engineering. For most applications, the 1.3 second transmission interval between the tele-engineering centre on Earth and the surface of the moon is acceptable. Two-thirds of the Chinese and African colonial centres on the moon are British-built telaconstructs. The next step is the design of intelligent machines to exploit the mineral wealth of Mars.

Education programmes, pioneered in the 1960s by the Open University, are another British product which leads world markets, exploiting the fact that English is the world's most widely spoken language.

The remote development of software and the remote solution of management problems have exploded into huge markets, in the wake of the globe-trotting programmer and consultant. Perhaps Britain's most distinctive contribution to the emerging global Infosoc has been the National Association of Experts, whose members encompass every branch of human knowledge. All over the world people dial in to the NAE's global video network, using the knowledge index to find the leading expert on ancient Chinese music, plasma physics, psionic research — or whatever. The opinion of the human experts supplements the vast factual information in the NAE database.

The NAE was Britain's fifth largest earner of overseas currency in 1989. It consumes no raw materials and runs on Britain's most precious resource — brainpower.

All of these developments took time and effort to launch. But it is worth recalling that the seeds of Britain's current prosperity were sowed as long ago as 1978, when the world's first home computing service was launched in our country under the title of "Viewdata". The happy and prosperous people of Britain in the year 2000 owe much to the great pioneers of that time.

> *The city centres, previously dominated by offices and banks, have been converted to urban funfairs.*

The social impact of Infosoc has been equally dramatic. At community work centres, workers log into a public terminal for their short daily shift, irrespective of who their employer may be. The old pattern of life where workers lived in suburbs and commuted to offices is fast disappearing. The majority of workers now live in the country, where the extended family (including aunts, uncles and grandparents) has been reconstructed. Juvenile delinquency and adult crime have been vastly reduced by adequate family care.

The family agrigan, with every smallholder rewarded for reaching self-sufficiency targets, has made Britain only a small-scale importer of food. The derided Green Circle Plan of the 70s came to fruition after all. The city centres, previously dominated by offices and banks, have been converted to urban funfairs.

Now that Britain is prosperous and stable again, the ruling National Reconstruction Party has announced that the reintroduction of democracy is imminent. Political parties will again be permitted. Before a decade is out, elections may even be held. It is to be hoped that Britain's progress towards the target of a democratic Infosoc will not be disrupted by small bands of agitators and malcontents, mostly backed and financed by anxious and less happy countries such as the People's Republic of America.

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NEWS IN BRIEF

PO £2m order for Marconi

THE Post Office has placed an order valued at about £2 million with Marconi Communications Systems of Chelmsford for the supply of 300 bps modems to be used in the Datel 200 service.

The U1106 modem is a single card which can be supplied either in a box with a power supply or rack mounted with a bulk power supply and up to six boards to a rack.

30 more terminals

THE Alliance Building Society's online branch investment and mortgage system is to be enhanced with the addition of 30 Transdata 313 printer terminals, worth £25,000. They will be used at branch offices in conjunction with VDUs linked to a Burroughs B6700 at the society's headquarters in Hove, Sussex.

Explosive

A BURROUGHS B1700 system has been installed by Nobel's Explosives, a subsidiary of Imperial Chemical Industries. The £70,000 system will be located at Nobel's Ardeer head office, and is to handle local processing and standard Hasp communication with an IBM 370 system.

Time sharing

ADDING to its IBM mainframe service, computer bureau Southwark Computer Services is offering an interactive time sharing service based on a Digital Equipment PDP-11/70 minicomputer operating under RSTS/E Level 6B. The service is aimed at software houses requiring program development facilities and at relatively inexperienced computer users.

Tally range

NEW UK distributor for the Tally T1612 serial buffered printer, Computer Marketing, is now able to offer the full range of Tally line printers and terminals, largely on an ex-stock basis, with full contract maintenance.

Philips installation

TO cope with the growing volume of invoices and other accounting routines, the R. H. Freight Group of Nottingham has installed a Philips Data Systems P410 business system.

Free brochure

A FREE six-page brochure has been published, detailing the services offered by the Engineering Mechanics group of Atkins Research and Development of Epsom, Surrey.

Scicon system will cut British Steel Corp production costs

SIGNIFICANT cost savings are expected to be made by BSC Stainless, part of the British Steel Corp, in the production of stainless steel at two of its plants which are now using a computer system developed jointly with Scicon Computer Services.

BSC Stainless has already invested over £90,000 in the project, known as Least Through Cost Mix, and the system is based on Scicon's two Univac 1108 computers at its bureau installation in Milton Keynes.

LTCM is a simpler method of working out the most cost effective "recipes" for varying grades of steel. BSC staff at the two plants, Panteg in South Wales, and the new £50 million facility at Tinsley Park, Sheffield, access the system via on-site VDUs linked to Scicon by Post Office lines. It is simple to use, as all the operator has to do is input the relevant parameters such as current value of materials, associated processing costs, and any practical restrictions. The least expensive option can then be produced in minutes.

Previously a manual system was employed in which "pencil and paper" work was sent to BSC's management services centre in Sheffield for processing on an Elliott 503 machine.

Development of the LTCM system took about a year, and the software is based on Scicon's mathematical programming system Sciconic, and is supported by a wide range of commercial software including MGG, Scipio, and Special Fortran enhancements.

It is likely that after another year or so of using the system, BSC Stainless and Scicon will market their expertise in this specialised application to other interested parties in the steel industry.

An interactive transaction processing system called Trax, for Digital Equipment PDP-11 systems, has been introduced by DEC at prices ranging from about £87,000 for an eight-terminal system based on a PDP-11/34, to about £140,000 for a 20-terminal PDP-11/74 based configuration. It includes a new intelligent terminal, the VT62, which provides form handling and error-detection capabilities plus a software system which places special emphasis on file handling, resilience and data protection capabilities.

US-Europe public electronic mail by the early 1980s

A TRANSATLANTIC electronic mail service by satellite between the US and Europe could be in full operation by the early 1980s, now that discussions are under way between the US Post Office and the postal authorities in the UK, France and West Germany. If problems like compatibility of equipment are ironed out, a month-long demonstration will take place in February or March next year, followed by a one-year field trial. This will involve the Intelsat satellite.

Meanwhile, the development of a domestic electronic mail network by the US Post Office has reached the stage where special transmitting and receiving equipment has been tested.

The equipment includes a very high speed facsimile type scanner for transmitting letters, and a high speed printer for the receiving end which reproduces each letter page on to A4 size paper. The pages are then automatically folded and put into envelopes by machinery developed by Pitney-Bowes.

The high speed printer was developed for the US Post Office by Versatec, the electrostatic printer/plotter manufacturer. It handles 11-inch wide paper, printing 8½ inch wide A4 pages on their sides at a rate of 175 inches, or about 20 pages a second.

This print speed, equivalent to about 80,000 lines per minute, is far faster than any electrostatic printer that is now available commercially. But it was not difficult to achieve, according to Versatec, because the speed of electrostatic printers is kept down in practice only by the inability of computers to feed them with information fast enough.

One of the biggest problems to be overcome before this public electronic mail system can go into live operation will be getting permission from the US government and approval from the general public for private mail to be opened and scanned in the Post Office at the transmitting end and printed out at the receiving end.

But with the vast distances between cities in the US, the speed offered by the electronic mail system could make it a very useful service for customers wanting fast delivery of letters that are not highly confidential.

Electronic mail will be one of the services offered by Satellite Business Systems, the firm in which IBM has a major shareholding, but the main difference between the SBS system and the US Post Office system is that SBS users will be mostly big companies transmitting electronic mail from their own terminal equipment.

Three big orders for Datatext

ORDERS for three large shared-logic word processing systems have been placed with General Computer Systems of London. The orders are for the Datatext IV announced recently (CW, May 29) which uses purpose-designed intelligent VDUs.

Two of the systems are going to Cadbury Schweppes at Bournville, Birmingham, and will form a 23-station network, using five different locations in the building. There will be two CPUs and six printers, and if one processor is out of action its screens can be switched to the other. The order is worth £140,000. Text storage will be on two 29-Megabyte disc units.

Purchase orders will be typed on the word processor, with the information from them simultaneously recorded on magnetic tape for transfer to the firm's IBM 370 mainframe. Thus the accounting system will be updated without duplicate keyboarding by the data preparation department.

A 12-station Datatext IV has been ordered by ICI Agricultural Division at Billingham. This is costing £84,000 and will be operated by two separate departments.

PDP-11/34 minis for Tote

AFTER a detailed study of how to computerise its on-course business, the Horserace Totaliser Board has decided to acquire six mobile systems, each based on two Digital Equipment PDP-11/34 minicomputers and supplied by Gamma Associates.

The six systems will be moved around the country along with 400 ticket issuing terminals manufactured by Control Systems of Uxbridge, which will also install and commission the systems, having been appointed as the prime contractors.

Apart from issuing tickets, the Tote systems will be used to calculate dividends and cash winning tickets and will be able to handle win, place, combination and multiple bets of any value.

Apart from Gamma Associates, some of the other sub-contractors include SEN Electronics, which is supplying disc drives for the systems; and Isle Systems of London, which is writing the software. The Tote was helped in its study by Software Sciences.

At one time General Automation looked like supplying the Tote systems but its contract was cancelled early last year (CW, March 31, 1977).

PROM agency

THE PROM programmer and simulator produced by ITT Components Group is now available through Rapid Recall. It has the ability to "blow" most of the popular programmable memories, and in addition eliminates the requirement for a teletypewriter or video display in target system development and debugging.

Co-op orders a 2960

IN the year since ICL announced the emulation facility on the 2960, orders for the machine have grown rapidly. Latest is the London Co-operative Society, which is replacing its ICL 1904A with a one Megabyte 2960.

Initially running under DME, the 2960 will be used to implement the society's new management control system which treats each of the 600 outlets in the London area as a separate cost centre.

The system will also cover Co-op bakeries, farms and funeral service.

DG system for yarn mill

STOCK taking time has been cut by half at Gratex, a US yarn mill, by installing a Data General Micronova-based general business system, according to general manager Cornell Bowden. The Data General system was chosen in competition with others from IBM, NCR, DEC, Burroughs and Wang because of its flexibility, its competitive price and the availability of several languages, said Bowden.

Gamma ray scanner from Union Carbide

A BRAIN scanner employing nuclear medicine techniques, the Cleon 710, is being marketed by Union Carbide. The system measures gamma rays emitted by a radioactive substance injected into the tissues.

The scanner uses 12 detectors to construct a picture based on the distribution of the radioactive substance which penetrates various tissues at different rates showing up anomalies such as tumours or strokes.

Dr Peter Ell, consultant in nuclear medicine at the Middlesex Hospital Medical School, where the Cleon 710 has been undergoing clinical testing since March, says that the immediate advantage to the patient lies in the reduced dose of radioactivity which is about 100 millirads, roughly one-twentieth of the dose administered by one X-ray scan, and which does not have to be repeated for successive scans.

The Cleon 710, which costs about £175,000 in the UK, is based on a Data General Eclipse S/230 minicomputer. A whole-body imager will be announced soon.

● The scanner manufactured and marketed by the UK company J & P Engineering of Reading (CW, April 20), which also uses the gamma ray emission tomography method, has changed its name to Tomogscanner, and the company has paid a royalty of £8,100 to Aberdeen University following its first year of export. The Tomogscanner, which costs up to £85,000, was developed in collaboration with the University between 1974 and 1977. *Clinical experience* with the *Aberdeen* prototype now covers six years, and with the J & P model, three years.

Meet suppliers at BETA Fair

AN EXHIBITION called the Business Equipment Trade Fair and aimed at the office equipment dealer is to be held in London next year.

It will be jointly sponsored by the Business Equipment Trade Association and the Office Equipment and Machines Federation and takes place at the Cunard International Hotel, from Sunday March 4 to Tuesday March 6, 1979.

It will enable manufacturers and sole importers to display their latest products to the trade and also provides an opportunity for retailers to meet the many new suppliers entering the market.

Only companies selling through the trade will be eligible to take part in the fair, and booking details are available from Roy D'Urban of BETA on 405-6233 or S. E. Wood-Higgs of OMEF on 549-7099.

OP SPOT

By Bernard Allen

It's 'carry on picketing' at GEC

THE GEC operator's strike is now in its fifth calendar month.

Much has happened during the affair and the latest development has seen the operators banned from all the company's premises in Coventry under a High Court injunction.

The injunction came about after the operators had staged a sit-in at the contract engineers' section of the company's Stoke, Coventry site. That action caused 100 engineers to be sent home for the day.

John Hardie, who is a shift supervisor at GEC and the operators' union representative, takes up the story:

"We entered the area at about 8.00 pm — the engineers start at 8.30 pm — and we barricaded the doors."

According to Hardie the matter was reported on BRMB, Birmingham's local radio station, and it was later mentioned on the BBC's Midlands Today programme.

That afternoon a local solicitor, acting on behalf of GEC, served the operators with notice of the company's intention to apply for an injunction to bar them from its premises.

At about 6.00 pm the operators vacated the area, believing that such action would negate the company's attempt to get them barred. They were wrong.

Hardie explains: "It was all very unfortunate. We thought that no action would be taken as long as we were not actually occupying the area." Consequently they did not contest the issue until on Thursday, May 25 the company was duly awarded an Interim High Court injunction. The order had a clause stating that the operators could be arrested if they went against it.

Documents to this effect were delivered to their respective homes on the following Friday morning but, according to Hardie, they had already congregated to stage another sit-in. This time the computer room was their target.

Hardie describes the scene: "The computer room was deserted and in darkness as we entered, but the machine was powered on with CICS and TSO up and running. So we closed the machine down and powered off in the standard manner."

Later in the day, the company's legal adviser, accompanied by the chief security officer and plant manager, served the operators with duplicates of the orders earlier delivered at their homes.

Says Hardie, "They gave us the orders but we were under the impression that we could only be thrown out by the county sheriff."

Hardie later received a telephone call from a person who informed him that an arrest by the police was imminent and who stressed the gravity of the situation. The operators left the computer room at about 3.45 that afternoon. The company then went ahead with proceedings for the injunction to be made valid on an on-going basis, and this was granted on June 6.

But if the machine was powered on and CICS and TSO were up and running, who had been operating the machines while the operators were on strike?

According to Hardie, a skeleton service is being provided by members of the company management, and certain systems and programming staff.

That state of affairs might seem to indicate that the operators' objectives are being easily thwarted, but Hardie points out that "three other sections within GEC have totally 'blacked,' and will therefore not use any of the computer output."

He says that the operators felt a bit isolated at the beginning of the affair because it seemed as if the other union members, understandably, did not fully appreciate their position. However, Hardie now feels they are fully aware of the operators' situation, and he is pleased that the support has grown in strength as the dispute has gone on.

In this context, the operators have produced leaflets giving information about the situation to date and calling for all ASTMS members to "black all computer input and output and refuse to use the VDUs", as Hardie puts it.

They have, of course, also regularly picketed GEC's Coventry sites "using no violence but just keeping everyone informed about the situation", says Hardie.

But their activities have not been restricted to Coventry, because on Sunday, May 14, they attended the ASTMS annual delegates' conference, held at the Dome, Brighton.

Recalls Hardie, "Ten of us along with some union officials left Coventry in a mini-bus at 4.00 in the morning. We wanted to give further publicity to our case and ask for financial support."

They stood outside the building with banners and waited for the delegates to enter the conference. Continues Hardie, "We spoke to some members as they went in and then we entered the visitors' gallery to watch the proceedings."

Hardie says that the venture was well worthwhile because one of the delegates spoke on their behalf and they collected £308 towards their strike contingency fund, "including a contribution from Clive Jenkins who wished us the best of luck."

Where do the operators go from here?

"Obviously we cannot stage any sit-ins, but we can carry on picketing and keeping everyone informed about our situation. One thing is for sure — we will definitely not give in," said Hardie.

HINT OF THE WEEK

Use a punched card to help with documentation

DOCUMENTATION is the topic of this week's hint, and it comes from Ron Linton, computer operations controller at Manchester Polytechnic, and a regular contributor of hints to Op Spot.

In a batch environment, precede each job with a punched card which has information relevant to the running of the job, says Linton.

He points out that a punched card is large enough to hold such data as the job class; the core storage requirements; the discs and tapes to be used; whether the job may be cancelled; and the telephone number of the programmer concerned.

The card may be taken from the rest of the deck after the job has been put through the reader, and given to the console operator for reference.

When the job has finished, the card can be placed with the deck and the job's output in order to be sent back to the user.

Using this method, information is at hand while the job is actually running in the system, which can do much to ease the task of the operator.

Getting the right perspective on the operations side

"IS Focus upset that operators are at last trying to rid themselves of the second-class status that has been their lot for far too long?"

So writes B. Porter, a chief operator from Dorset, in response to an article (Focus, May 11) which previewed a DPMA meeting concerning the relationship between operations staff and DP management (Op Spot, May 25).

Porter defends the "operations side of this business", and puts some of Focus's comments in perspective.

In response to the claims that "many DP managers have graduated through the operations department," and that "it is essential in the interests of the company, that the DP manager keeps his operating hand in," Porter says:

"The number of DP managers to have risen from the operations side must be few, and fewer still are likely to try and keep 'an operating hand in', as their operating days were probably two generations of machine, and half a dozen releases of the operating system, ago."

In reply to the comment that, "Half an hour after the commencement, the operators present will call for a coffee break," he adds: "Operators do work irregular hours and are forced to take irregular coffee and meal breaks, which are prone to frequent interruption and so are all the more precious."

Pointing to the value of an efficient operations department, he continues: "When it comes down to basics, it doesn't matter how many nanoseconds a programmer can save in writing the most brilliant of programs — if the operators don't know how to run it, or it takes so long because of disc, tape or paper changes that the output will be delayed and the user upset."

In this context, he points out that DP managers "lavish money on new equipment or new software packages without organising adequate training for the operators, and then wonder why there are problems."

Finally, he has some advice for the author of the Focus article: "Next time Focus, don't be so rash in what you write."

What is the law on emergency exits?

OPERATIONS staff often come up against difficulties when they try to ensure that acceptable standards are established and maintained in matters relating to their work and working environment.

It is in this context that an operator from Staffordshire writes to Op Spot and asks, "Is there a law which states that there should be two exits, one for emergencies, from the machine room?"

He continues: "Where I work at the moment the computer room has only one exit and the operators would be trapped in the case of a fire. This is in contrast with all other sites that I have worked at or visited, for they all had at least two.

"This matter has been discussed at various meetings between the operators and our union representative, but it is apparent that it may take some time to get an emergency exit put in — if they decide to do it at all."

I contacted several experts about the matter and the legislation mentioned included the Health and Safety At Work Act, and the Fire Precautions Act of 1971. The most practical advice I was given, and will now pass on, is this:

Contact your local public health inspector, or get in touch with your local branch of the fire brigade and ask for the fire prevention officer.

In either case explain the situation to the authority on the matter and he will take the appropriate action.

Operators often complain that nobody listens to their point of view. Well, Op Spot is listening and Bernard Allen would like to hear your opinions and ideas on all matters relating to computer operations.

Your letters should be sent to Op Spot, Computer Weekly, Dorset House, Stamford Street, London SE1 9LU. Telephone calls are equally welcome and Bernard can be contacted directly on 01-261 8035.

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Published by SITPRO (Simplification of International Trade Procedures Board) and NCC (The National Computing Centre).
Available from Technical Bookshops, NCC Offices or J. M. Dent, Dunhams Lane, Letchworth, Herts.

NCC The National Computing Centre
SITPRO Simplification of International Trade Procedures Board

More staff taken on by Systime

AS part of its expanaion plans, the Leeds-based minicomputer syatems manufactorer, Systime, is currently taking on more R&D staff, including engineera and software development personnel.

They will work for two aenior managers who have juat been appointed by Systime to report to the firm's technical director, Ian Fallowa. One is Barry Slinger, formerly plant engineering manager with Mullard at Hezelgrove, Cheshire, who has taken over as product devalopment and engineering aervices manager at Systime.

The other new man is Ian McNelll, who haajoined Systime aa syatema software davalopment manager. In thia poat he will ba responalble for tha development of operating syatems, networking syatama, telecommunicatlona and eoftwere for micro based controllers. Ha waa formerly a aenior project manager in the computer apeciel syatems aaction of Digital Equipment at Reading.

SHOWN on its way to the Ninian oilfield is the Howard Doris platform. One of the design contractors to Chevron Petroleum (UK), was a recently-acquired subsidiary of University Computing, Electronic Calculus Ltd. ECL conducted finite element analyses of the entire structure, and also used its space frame analysis program, Eclipse, for discrete analyses and design checks of the steel deck. Chevron had aaaaaa to UCC's twin Univac 1108 installation.

Logica takes look into the future

TWO new books have been publiahed by the Simplification of International Trade Procedures Board; one illustrating the possible future trends for computer systems and the other setting out recommended atandarda of data formatting for those in the import/export buslness.

The flrat book*, "Future Trenda in Computer and Communicatlons Systems," was prepared by software conaultancy Logica for SITPRO aa part of a project to develop standarda for data interchenge, detalls of which are given in the second and bigger book*, "Computers in International Trade and Trensport — Data Standarda."

In looking at poaible future trends, the Logica study makes a number of predictions, which it backs up with graphs, tables and other illuatrations, on what aort of changes one can expect to taka pleca between now and 1990 — although it does venture as far as the yeer 2000 in the last chapter.

Among its basic conclusions, it states that "the prices of processora will decrease drumtically, particulirly those of microprocessors," although it doos balnnce this with the further atatement that "trends in software are onlikely to lend to similar reductions in costs, but are expected to lend to improvements in the implementation and operation of computer systems."

Among other predictions nrc that therc will be limited improvements in public telephune/telex networks for the period under study, bot new data networks will offer grently improved transmission fociltias; end computar systems, particularly databasea, will gradually become easier to uae in terms of physical access and easy-to-uae languages.

And in the long term (1990 onwarda) computer systems may develop to the point where complex calculations will be carried out on hand-held or desk-top devices, mainframes being used primorily for datobase applications.

Thè second book, "Computers in Internationnl Trade and Transport — Dato Standords," is, in fact, a monuol for UK trade and transport orgonisntions that provides them with a glossory which itemises the standord formats for documentotion nnd recommenda ur lists coding systems thnt covcr the requirements of importers/exporters, forwarding ogents, corriers, port euthorities, ond HM Customs.

Further sections uiso deal with standnrds fur the interchnnge of dotn botween computers ond uther relnted equipment over telecommunicntions links, or by other madia such as magnetic tape.

All tho standords hnve been designed to he independent of both the type of computer and system application, and the plete. It comes in two loose-leaf volomes and was compiled with the nssistance of over 90 UK companies and organisations.

*"Future Trends in Computer and Communications Systems" costs £8, and "Computers in International Trade and Transport — Data Standards" costs £36. They are available through NCC Regional offices or J. M. Dent (Distribution) Ltd, Dunhnm Lane, Letchworth, Herts SG6 1LF.

On show in Switzerland

THIS month sees the latest in a growing number of European microcomputer exhibitions and conferances, when IMMM '78, the International Microcomputar, Minicompuler and Microprocessor show, gets under way for the third time at the Palais des Expoaitions lo Geneva, Switzerland.

Over 90 companies are taking space at the show, which runs from June 20 to 22, and the exhibition will be supported by three days of conferences, with three sessions running in parallel on each day.

Among tha well-known nomes scheduled to appear are Ampex, Data General, DEC, Ferranti, Hewlett-Packard, CII Huneywell Bull, ITT Consumer Products, Imsai, National Semiconductor and Plessey. Other companies come from Switzerland, France and Italy.

Further information can be obtolned from the organisers, Kiver Communications, at 18/185 Ewell Road, Surbiton, Surrey.

Where next with standards?

● From page 4

that o series of switchnble optiona should be provided so that extensiona beyond e standurd could be rendered non-operotive when necessory.

Agreement that more rapid progreas must ba made seemed to be unanimous, but how the rate of progress might be eccelerated was not quite so cleor. Feors were expressed that international standards, once adopted, might prevent or retard further progrcsa. This point leads to a need to apply cercfully tha ISO five-year review ruic. All ISO standarde are reviewed by its own committeea on eech fifth anniverearv of their endorsament. A cicer ruling thot standards should not continuc to be cxtant unless positively supported by a mejority vote could and would solve the point made above.

One of the major obstacles to progress is the limited effort which le contributed to ISO's work. Excepting vendors of herdware and software, who often fund attondance of their representative, effort contributed by members of the user community is almost wholly voluntary and hindered by leck of funds to cover the contributors' time while attending formal ISO meetings, and travel expenses. A classic recent exampla was the necessary revision of the Algol 60 standard (ISO-R/1538) by Dr David Hill of the Clinical Research Council, Northwood. His revision could not be progressed at a recent formal ISO meeting in his absence due to a lack of detailed appreciation of the revision, yet the uuthor wes not able to attend the meeting.

Sume way of funding participatiun, particularly of servicea of highly competent exporis who era usually too good ot their primary (fee) jobs and ora nlways busy, must be found. While some efforts could be channelled and co-ordinated by bodies such as the professional societies (eg the BCS and the IEE and the IDPMA) they do not huvo the funds to mount such an operetion. Indeed, their present role is in a rather different area, they are often able to identify and quentify requirements from soundings from a wide number of interested and activa parties — including their full membership in important cases, and can advise nn policies, eg when should a standard be withdrawn?

There are signs that the user voica is beginning to be heard and appropriate co-ordinating bodies are appearing — such as the NCUS and the NCC in the UK. Its many guises. Hopefully the government funds will soon be forthcoming for work in this vital area — similar to those available in countries such as West Germany where GMD, the NCC's counterpart, has an annual budget approaching £15m from goverement funds, and Japan, which actually has a government-fuoded Computer Usage Institute. This is furthering informatics projects in such important areas as open systems working.

Let us hope that, in this area at least, the UK's working principle is not again "slowly"?

Rory Johnston reports on the International Word Processing Exhibition at Wembley

Great minds think alike in paperless communication

ELECTRONIC mail was the hottest topic at the International Word Processing Exhibition at Wembley last week. Several manufacturers showed their machines communicating with each other over Post Office lines.

These demonstrations made the point forcefully that the obstacles to full-scale paperless communication between firms are now largely administrative and political rather than technical.

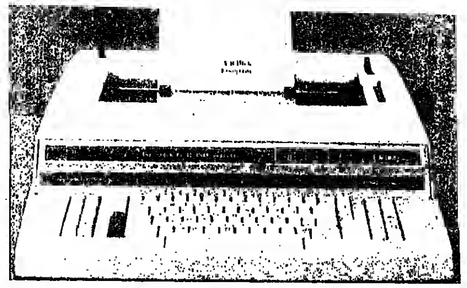
As far as other technical developments go, it was clear from the word processors on show that their capabilities are rapidly converging; most can now do more or less the same things. Forwards-and-backwards printing, justification, decoupled printing, and other features are becoming almost universal. It would appear the designers are working on the principle of "Great Minds Think Alike".

User interfaces and their ease of operation, however, are not nearly so consistent.

Twenty-nine word processor suppliers displayed their wares at the show, along with several component distributors and makers of dictating equipment. BETA, the organisers, report that 6,239 visitors attended, a 40% increase over last year; yet the show did not seem particularly busy, perhaps because the number of suppliers in this market appears to be increasing faster than the number of customers.

Prominent among the machines seen communicating at the show were the Philips WP5001, Logica's new VTS/100 (CW, June 1), and the Ontel machine, being sold as the Monotype 80 (this last machine is also being sold by Interscan, who call it WordCom, and by Olympia).

Programmability is a novel feature that several word processors on show now have: the DEC WS78, the A.B. Dick Magna II, and the Rank Xerox 850 range among them. This allows the user to record a sequence of editing keystrokes in the memory, and then perform long repetitive operations automatically, in the same way as some calculators now work. This promises to be very useful.



Pictured right is the new Magna II from A. B. Dick, costing £6,690. It uses magnetic cards for storage, both of text and user-defined programs.

Of the new models on show, the star was definitely the Xerox 850 Page Display System. It is so new to the UK that the Rank Xerox staff themselves know not much about it, and it has a suitably astral price: £11,050 to buy, or £420 a month to rent. Its most impressive feature is the large screen, 102 characters wide by 70 lines high, thus big enough to show a full page at one time and make layout considerably easier. The characters are clear and are displayed black on white, and this being much more like paper than many WP screens, it will probably appeal to typists.

The cursor on the 850 is moved about by means of a capacitative disc. According to where you put your fingers on the disc, the cursor moves in the corresponding direction. This is quite a convenient device but it struck some users as rather too much of a gimmick.

The 850 uses floppy discs for storage. There are relatively few function buttons on the keyboard, most operations being selected from a "menu" on the screen. All the features of the 800 screenless machine are there, together with new ones such as automatic expansion of abbreviations. User programming is done with a special command language, typed as text.

Another newcomer was the Digital Equipment WS78 standalone machine, which is sold by Hamilton Rentals. This costs £9,975 and incorporates the usual twin floppy disc drives and Diablo daisy wheel printer. The command language is conventional, using both menus and a large number of colour-coded function buttons. Unlike most screen systems, the cursor cannot move about the screen but stays always on the bottom line.

Documents can be put together from standard "boilerplate" paragraphs, and letters can be typed repetitively with addresses inserted from a name and address file. The insertion program can be quite complicated, using "If" instructions operating on data in the address file.

Also on the WS78, function keys can be defined as "macros," so that one key represents a sequence of keystrokes, and these macros can even be nested. This feature is used for tasks such as moving columns of figures left or right, as the machine has no special table mode for that purpose.

Other new stand-alone machines were introduced by Siemens, and by Fortronica, the Scottish firm which hitherto has specialised in banking terminals.

Scientific applications are receiving more attention, in that several machines can now produce complicated mathematical typing, with subscripts and superscripts, Greek letters, and scientific symbols. Among these machines were the Logica VTS/100, the Monotype 80, and Vydec's systems.

A sheet feeder-stacker for the ubiquitous Qume printer was on show on the Facit-Addo stand. This can be used on any Qume printer, requiring only a form-feed code from the software to drive it. It has the disadvantage that the typed sheets are stacked in reverse order.

Making a guest appearance on the Logica stand was Cy Endfield, inventor of the Microwriter, which was featured in Computer Weekly on May 11. His hand-held word processor attracted plenty of attention.

Mental indigestion was the main problem of many visitors, faced with such a large array of machines that appear on the surface all to be the same but different. One visitor took to striding on to stands and saying, "Right. Why is your machine better than all the others?" Aside, he confessed, "They all seem much of a muchness to me."

Understanding the significance of the subtle differences between systems will require a great deal of user education.

● One exhibitor reported considerably higher sophistication among his enquirers than last year. Many had quite a good idea of what they were looking for, he said, and some even had checklists of features.

Conference offers an up-to-date assessment

THE value of OCR in word processing was emphasised by Dale Kutnick at the Word Processing Conference. It is more economical, he claimed, to type first drafts on ordinary typewriters and then feed them into a WP by OCR, rather than to type them on the WP straight off. This saves on capital investment on WP keystations.

"Why use a $15,000-plus machine to do something that can be accomplished equally well with an $800 machine?" he asked.

This arrangement also allows the present organisation of the office to be maintained, he added.

Kutnick is director of market research at the Yankee Group, a consultancy based in Cambridge, Massachusetts. He was one of three American gurus who were among the speakers at the conference, "Word Processing — An Up-to-Date Assessment," which ran concurrently with the exhibition. The others were Phil Dorn, of Dorn Computer Consultants, and Jeb Eddy from Dataquest, based in the heart of Silicon Valley.

The importance of phototypesetting direct from word processors was emphasised by Jeff Thomas, of the Solicitors' Law Stationery Society, and Harry Belsey, a communications manager from BP.

In the foreground is the Xerox 850 Page Display System, showing the large, black-on-white screen and the cursor control disc. The 850 Display Typing System, which has a single-line display, is in the background.

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DATAPRO HONOR ROLL

The value of Loglan as a useful tool in machine translation

EVERYONE has heard of Esperanto, and many people speak it. But few people have heard of Loglan, and even fewer speak it. Why then might it be useful, particularly in the field of machine translation? An examination of some of its features reveals that it goes some of the distance in meeting the requirements of an Intermediate Text Language for translation, though it still has some way to go.

Loglan was started about 1955 by James Cooke Brown who was a social psychologist on the faculty of Florida University. His aim was to test a hypothesis of a linguist named Benjamin Whorf, that "the structure of the language spoken by a people determines their world view; that is, it sets limits beyond which that world view cannot go."

His aim was to invent a language based on predicate logic so that when people could speak it and even think it one could then discover whether their world view was changed by the process. In an early article in Scientific American (June, 1960), he disclaimed its potential as an international language.

However, by the time he published Loglan I (third edition 1975), he suggests that "Incidental features such as whether a language is easily learned or not, or speakable by computers, may well turn out to be decisive. Loglan, or some other mechanically-apt tongue, might very well be ripe for that."

It is this minor aim, of a language useful for computer use, that is considered in this article. In particular, the issues of meaning and inference are among the liveliest issues in natural language processing today.

For example, Roger Schank of Yale states, "Five years ago, or so, our research was concentrated on finding an adequate meaning representation for sentences. We then began to run into problems of inference. Even if we could analyse sentences for their meaning we did not know exactly what we had to do with those meaning structures we got as output." (Machine Intelligence 8, 1977.) It is obvious that a usable language based on logic could well contribute to the solution of many of these problems.

By CHRIS MOSS

Currently half-way through a PhD course at the Imperial College of Science and Technology, Chris Moss' research is centred round logic programming. He has also spent five years as a programming consultant at Essex University.

The main features of Loglan are: a phonetic system, which uses only 21 basic sounds, and each one has an equivalent in the normal (Latin) alphabet; a vocabulary, which has passed 4,000 words and is still growing; and a grammar, which is of most intrinsic interest in this context.

An example of written Loglan, with a word for word English translation and idiomatic translation will give some idea of what the language looks like. See Figure 1.

In Loglan there are only three parts of speech: (1) Structural words, (2) Predicates and (3) Proper names.

All the descriptive words of a language — nouns, adjectives, verbs, etc — are grouped under the title "predicate" and are treated exactly alike. The structural words correspond to words such as "the," "and," "for" in English, and make up the whole grammar of Loglan. It is always possible to parse a sentence of Loglan without knowing the meaning of any of the predicates or descriptive words.

As there are only some 200 structural words in Loglan and as they are intended as a "complete" set, this is an obvious benefit for computer based systems.

Structural words are the most common in any language including Loglan, so they are all short — essentially monosyllables. Predicates have at least two syllables and end in a vowel. Names have two syllables or more and end in a consonant. It is thus trivial to parse a sentence in written form, and the same care has been given to the conversion from spoken to written form, which is of relevance for voice recognition equipment.

A predicate, in logic, is a description of a state, an action, a quality etc. Thus, if one wishes to assert that X is blue, one asserts: Blue (X).

In Loglan one asserts this as: "da blanu"; where da stands for the universal pronoun (he, she, it etc), and blanu for blue. Since there are degrees of blueness we may say that one thing is bluer than another. In fact, blanu is a two place predicate in Loglan, so "da blanu de" means "X is bluer than Y."

There are actually five words for "it" in Loglan — da, de, di, do, du — and they have the same function as variables in logic. One normally uses them to refer to objects previously mentioned in the conversation: da for the last object, de for the last but one, etc. Once used, they keep their value within the context.

Three and four place predicates are not so common but are useful for words like "sell"; "da vedma de di do" means X sells Y to W with price Q. The third and fourth arguments are simply strung along after the others.

The verb "to be" in English is regularly criticised by logicians and has no equivalent in Loglan. To say "he is a man," one simply says "da mrenu," which conveys no implication of tense. To add the idea of "now," one uses the word "na". Since there is no conjugation of words in Loglan, this is kept as a separate word, as are the words for past (pa) and future (fa). See Figure 2.

The diversity of English expressions which mean the same thing or have subtly different meanings logically is one of the difficulties of most languages which, in theory, is eliminated in Loglan. Another example is the use of the definite article "the" in English. There are three words in Loglan which have this function:

le — describes an object,
la — starts a name,
lo — is used in an abstract or collective sense.

When one of these precedes a predicate it turns it into an object. See Figure 3.

The confusion in English is well observed in the last case, where it is valid to say "the lion is found all over Africa," "he went hunting lion," "Kenya is a good country for lions." In each of these cases, it is the collective sense which is intended, and for both computer comprehension and translation the distinction may be vital.

An important linguistic ability is to put ideas together to form more complex ideas. Thus we put "short" and "man" together to make the phrase "short man." But, Brown points out, "we must inquire more closely into the meaning of such phrases." If X is a short man, does this mean that he is short and a man? Not necessarily; for he might be fairly tall, say, for a woman or a child.

All we can surmise is that he is short for a man; that is, a short type of a man. What about blue houses? Can we expect them to be really blue? All over? Inside and out? Certainly not . . . they are blue among houses, not among skies.

Placing predicates together we form a metaphor which can only be understood fully by taking the words together. Loglan follows English, and most of the other major languages it is primarily based on, in placing the modifier before the word it modified. Thus "short-men" is written "corto mrenu."

It is when we put three predicates together that we face the danger of ambiguity in most languages. Thus if we say "pretty short man" do we mean a man who is pretty short, or a short man who is pretty?

Since we tend not to describe men as pretty — we would probably opt for the first meaning. But change the phrase to "pretty little girl": we might either opt for the second, or indeed a third meaning — that she is a girl who is both pretty and little.

Loglan has an invariable rule — predicates group to the left. Thus "pretty short man" means a man who is pretty short. To write the other phrases two other structural words must be employed; ge is a grouping operator, which groups the predicates following, and ce (pronounced "shar") is used for "and" between predicates.

le mrenu	the man (or a man)
lo mrenu	Man, or men
la Djan	John
le blanu	the blue object
lo blanu	blue (the colour)
le simba	the lion
lo simba	lion, lions, the lion

Figure 3

Thus "pretty ge little girl" means "a little girl who is pretty," while "pretty ce little girl" means "a girl who is pretty and little."

This doesn't exhaust the possible ambiguities. Does the phrase "red and blue ball" imply that we can claim independently that the ball is red, and that the ball is blue? No, the common interpretation would be that the ball is a mixture of red and blue. Thus, Loglan has yet another connective: ze for this possibility.

In conclusion there are many constructs — for explanations, questions, etc, that cannot be touched on in the space of a short article. Neither is it possible to deal with his preoccupation of inventing words which have a high "recognition rating" across the world's major languages. But it is interesting to ask how many of the desirable characteristics of an Intermediate language Loglan possesses.

It strikes at the heart of the major problem of translation by machine, which is that of an unambiguous statement of the meaning. This probably counts against its acceptance as a spoken language. As Brown says, "If Loglan is unambiguous, it may therefore prove as remarkably unsuited for poetry as it is, we hope, suited for thoughtful discourse."

Since the future of machine translation lies in the technical, business and scientific fields, rather than in the translation of poetry, this may not be much of a disadvantage. Many of his ideas, for instance the complete exclusion of prepositions, repay study.

The grammar of Loglan is a model of simplicity. If Esperanto boasts only 16 grammatical rules in the formation of words then Loglan has only three, since words are not conjugated at all. More importantly there are only about 250 rules for constructing sentences, compared with 6,000 to 7,000 discovered so far by machine translation work on English. It is possible that the "conceptual dependency" analysis of Schank and others will reduce this number even further.

It is ironic that it is in the area of vocabulary that Loglan is probably the weakest as a vehicle for machine translation, since what is needed is a comprehensive dictionary which distinguishes all the different meanings of words, used in differing contexts. For this purpose a number is quite adequate for a computer, though the many-to-one translation process is still an unsolved problem. A good dictionary for a limited area of discourse is still the key to most successful machine translation projects, such as Loh's Chinese to English work. If Loglan is spoken by humans, then the problem of ambiguous meanings will surely soon occur once more.

The value of Loglan may well be to underline the contention of the American logician W. V. Quine, among others, who argues that there is a simple logical structure underlying English, and all natural languages. Perhaps this should be the basis of an intermediate text language.

An example of Loglan

la narmi gilda grupa cefli pa sadho
(the) army guida group chief (past) say
The chief of the group of army guides said

koko da pa nu pluci po sadho
(that) it (past) (passiv) please(-ing) say
that he was pleased to say

ko da papeca sanzo le ri lekto . . .
that it (pastfar) know the(many)fact(pause)
that he had known the facts for a long time.

li la no da mandu mi lu da pa forli sadbo
(quote)certainly it2 deceive me(unquote) it1 (past) strong say
"they certainly did not deceive me" he said forcefully

li nu nia de pa trati lu e pe
(quote) (passiv) however it2 (past) try (unquote) and (past)
"even though they tried" and

djori seninin de pe lokao vi la vu
order 700 it2 (passiv) lock here the (few)
ordered 700 of them locked up in

kruma po da
kroom of it2
their rooms

The above piece of Loglan is taken from James Cooke Brown's article in Scientific American (June, 1960) with a word by word translation on the second line, and the English original on the third line. A few changes have been made to reflect updates to Loglan since 1960.

Figure 1

da na vedma de	he is selling it (now)
da fa vedma de	he will sell it
da pa mrenu	he was a man
da sucmi	he swims (i.e. he can swim)
da na sucmi	he is swimming

Figure 2

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REGISTRATION FORM

English is major source

JUDGING by your correspondence, there seems to be an active and healthy interest in automatic language translation, but most of the writers appear to have either missed or sidestepped what to me is the most significant feature of the problem: whether there is in the first place any requirement to translate from N languages into N languages.

I challenge Dr Mankin's assertion (Letters, April 13) that the EEC languages would require 100 translators, on the grounds that it assumes that every combination is going to be needed; the real requirement to translate Danish to Italian or German to Irish must be very small indeed, and could hardly be significant enough to cost-justify the production of the necessary translators.

Such a pragmatic approach would probably reduce the figure of 100 to nearer 20 or 30. Still, it is true, more would be needed if an ITL were to be used, but this would probably be justified by the increased elegance of each individual solution. This argument could, of course, be extended beyond Europe.

In many ways the situation is analogous to the software house which produces an operating system, database management system, report generator or TP monitor by starting from an idea and then implementing it. When challenged, they will naturally assure you that they consulted "the users" (real or potential) and implemented the system in accordance with stated requirements. In practice many such a package has solved a theoretical problem perfectly, but very few people's real problem adequately. Here I believe that the real problem is not to find a general technique for translation, but to produce a comparatively small number of actual translators.

If the full matrix of translators were required then I should agree that an ITL would provide the best approach (though I should still argue against Esperanto as the best choice). However, I see English not as an ITL, but as the major source and target language, without the need for an ITL.

One final point: I should like to thank the anonymous donor who sent me a pamphlet about Esperanto. I have a great respect for that language and for the ideal which it sets out to fulfil, and I have never denied its value; my objection to it is solely to its use as an ITL.

P. G. SEBBORN
Harpenden, Herts.

Strong feeling of equality . . .

DR R. Mankin (Letters, April 13) in discussing the choice of an Intermediate Translation Language, labels languages quite rightly, of course, as "living languages".

I would qualify this a little, however, because to the vast majority of people there is only one "living language" — that is the one they individually use every day for all purposes, among their friends of the same nationality and locality.

Any other language is a "learned" language, quite distinct from their own living language.

With a "learned" language, unless you happen to emigrate or live for a long time in the country in question, you can never feel for the language as one does for one's own, but all the people you are speaking with are speaking their own living language and there is thus a feeling of inequality.

With the language Esperanto, we have a language that has been learned by each user and therefore there is no feeling of inequality. In my own experience of over 45 years of using Esperanto with many friends abroad, and the euphonious and expressive nature of the language, this feeling of equality is very strong, to the extent that the mutual feeling for the language makes it into a true living language.

Indeed, the taking part in large international conferences where Esperanto is the only language spoken, and experiencing the spontaneous audience reaction when the speaker makes a purposeful, or a witty, or even a poignant remark, makes one wonder what adjective can describe the language Esperanto if one does not use the word "living".

Dr Mankin says that if "our Intermediate translation language ever becomes widely used it will promptly diversify into many dialects . . and generally disqualify itself from use as an ITL". What Dr Mankin has not taken into account is that Esperanto will never become a replacement for national languages and be used locally, and will thus never produce dialects.

Some Esperantists are currently organising the systematic checking of translations by means of Esperanto. Where some document is translated into several languages, how can it be independently checked that each version gives identical information to each reader?

The true meaning of each version can be discussed between Esperantists of each nation concerned, and any differences ironed out. This seems to me to have similarities with the idea of an intermediate translation language.

J. A. BRISCOE
Harrogate

Readers should note that correspondence on this subject is now closed.

Improve the efficiency and throughput of peripherals

I HAVE followed with some interest the letters concerning the choice of an ITL. Most of your correspondents assume that such a language is necessary. I would question whether the whole concept of machine translation is worthwhile in any practical sense.

In practice most users of translations have specialised needs. The translation requirements of legal documents, novels, poetry and scientific texts, for example, are very different. There would be little point in devising a general program to translate these. Even in any single area it would be unwieldy, long, complex and still prone to error. In fact it would still also need translators for checking purposes since both hardware and software are insufficiently reliable even if an acceptable program could be written.

If approached from the user's point of view the translation problem becomes more tractable. The user needs rapid, reliable, accurate translation. Currently this means using human translators, but even in the event of an acceptable program being produced they would not be eliminated. If we cannot escape the need for human translators it is best to concentrate on ways to improve their efficiency.

If the emphasis is changed from machine translation to machine-aided translation (MAT) then immediate gains in throughput could be made within the limits of existing technology. One possibility that springs to mind is the use of word processors which possess a dictionary look-up facility. (These may be available, but I have never come across one).

There can be few putative computer applications quite as inappropriate as language translation by computer. We have an excellent, purpose-built, extremely cheap, superbly reliable and subtle computer in the human brain. In the commercial world it would be madness to replace a computer with the above characteristics by a slow, inaccurate, hideously inefficient machine designed for an entirely different task simply because the peripherals were too slow. The logical answer is to improve the efficiency and throughput of the peripherals, not scrap the machine.

JOHN COOKSON
Harpenden, Herts

Esperanto lives

AS A teacher of five languages, including some of those mentioned by Dr R. Mankin (Letters, April 13), I would like to make some observations on what he had to say about a possible Intermediate Translation Language (ITL).

He writes as though an artificial language must be a dead language. This isn't true at all in the case of Esperanto. My definition of a living language would be a language which people are currently using on a regular basis. In my own case Esperanto is the day-to-day language of our home. I would agree that it is an artificial (I prefer the word "planned") language in the sense that it was made with skill or artifice, but it "lives" in the people (estimated in the millions) who speak, read and write in it.

If Dr Mankin seeks a widely used language of regular structure for use as an ITL he would certainly find Esperanto worthy of serious consideration.

He is wrong to suppose that if such a language became widely spoken, as Esperanto is, it would diversify into dialects, develop irregularities. This simply has not happened with Esperanto. Its creator allowed for both growth and control, the latter by an academy of accomplished linguists, and one of the strengths of Esperanto for use in the international field generally is its Standard form, compared with say, English, which has indeed diversified into dialects.

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The problem of finding suitable sales staff

By Alan Williams

of Sales and Marketing Recruiters

IT has been apparent for some considerable time that the availability of competent salesmen with a proven record of sales success within the computer services industry is extremely limited.

The reasons are basically simply:

1. Salesmen need to have very special reasons for leaving one bureau to go and work with another for much the same rewards. Such apparent justifications as more effective management, broader product range, success conducive environment, greater personal freedom, greater potential rewards, etc, are somewhat amorphous and mean much more to management inside, than candidates outside. Such intangibles are regarded with suspicion by potential recruits, and generally represent insufficient justification for returning to the hazards of the "commission trough".

2. The emergence of the minicomputer, with its demand for commercial applications expertise, has created an attractive diversion for successful salesmen within the services sector wishing to advance their income and experience.

3. The computer industry, with the exception of some mainframe manufacturers, is by and large not investing in the growth of new sales people, yet at the same time individual sales forces are being expanded in order to sustain very high growth rates. This has resulted in an incestuous situation where companies are "poaching" staff from each other and at the same time making it possible for the most incompetent sales personnel to survive.

Salesmen usually change jobs for one of four reasons: enhanced status; greater assured income; widening of product experience; and greater career prospects.

Of these, the first two are far and away the most typical. Other justifications such as personality clashes, personal politics, company policy, etc, are les often as not excuses for personal failure.

Frustrating though it might appear from the point of view of the computer services sector, it may well be that it could have to resign itself to becoming the training ground for the industry as a whole, ie, the point of entry via which salesmen can move into the total computer industry. If this is so, then the implications of a constantly moving sales population will have to be accepted and managed accordingly.

In this context, and from the point of view of its own increasing needs, it is essential that typical "stop-go" recruitment is replaced by an ongoing recruitment strategy for the location and training of new personnel. Implicit in this situation is the need for management to understand and accept the need for ongoing training and the related increase this will bring about in sales costs.

There are undoubtedly many men and women within the computer industry who have much experience of computers and applications and would be attracted to selling as a career. However, it is likely that the people most likely to succeed are those who have already proved their ability to establish a good working relationship with end users.

While some successful salesmen have come from an operations background, people from this environment tend to be remote from the client's actual applications problem, ie, they understand tools rather than applications solutions.

Sales support analysts are a more obvious source of good material, for by the very nature of their function they are constantly exposed to client situations, proposals, presentations, general communications and so on.

The location of sales recruits from outside the computer industry is a function of one or both of two disciplines: selling skills and applications experience.

If one accepts that the prime function of the salesman is to sell benefits, then to a degree, any accomplished salesman should be able to sell anything. However, the related necessity of being able to establish professional credibility via a complete understanding of the client's problem, and relate it to a computer-based solution, demands a reasonably high level of intelligence, and the ability to communicate effectively at all levels. If this can be reinforced by meaningful experience within a related business environment, so much the better.

In the commercial applications context, salesman who have successfully sold clerical systems or office equipment, often have many of the basic skills and disciplines to succeed in the computer services industry. The major change of discipline in this context is often a significant increase in the duration of the sales cycle.

On the other hand, there are many people outside the computer industry who are well versed in commercial and technical applications with both the characteristics and aspirations to make effective salesmen. Their technical ability to understand the client's problem certainly gives them a degree of immediate credibility. However, many such people grossly underestimate the level of work, discipline and frustration involved in selling, and the assessment of individual applicants needs to be most rigorous in determining that chosen recruits have the necessary characteristics for success in a sales career.

Advertising needs to be created in such a way that maximum "mileage" is achieved in terms of both company promotion and candidate response. The use of anonymous advertising via a recruitment agency should be limited to situations which might indicate a company failure, cause problems with existing employees, or repeat a failed recruitment exercise. For this reason, it is important that the client's marketing department, and in particular public relations people, are also involved in the exercise. The appearance of advertisements should not be ad hoc but planned from the outset as an ongoing strategy.

The best medium for the location of personnel already employed within the computer industry is the computer Press. The speed at which advertisements can be placed is four to six times faster than the national Press. The cost can be seven times less than that of national newspapers. Response can be good, but like all advertising, is a direct function of the precise nature of the job and the availability of directly compatible personnel. Any advertisement can be worded to give a heavy response without attracting the right applicants.

For the location of people outside the industry, there are two principal journals, The Sunday Times, and the Daily Telegraph. By and large, people who read the job advertisements in the Daily Telegraph are actually looking for a job. Those who read the similar columns in the Sunday Times do so for reasons both of need and interest. Certainly, active business people, by and large, have more time for reading newspapers on the weekend than during the week.

Many companies turn their back on the recruitment of sales trainees because they see them as a net loss for at least the first year of employment. Those who do so also tend to think of the salesmen as someone who sells all the company's products to the total marketplace. It is not necessary for the salesman to be fluent in his company's total product portfolio to achieve sales success.

The vertical training approach used by Sales and Marketing Services relates selling skills to a particular product or range of products within a specific marketplace or industry. All sales and product training is locked into that avenue.

This is followed by campaign selling in the field so that classroom information is consolidated into "real-world" action. During such periods, all salesmen are actively selling the company's products, not just "swanning" around as observers of the selling process. This phase is then extended by further training to add further product/market knowledge and new selling skills as well as rectify existing problems. The process then continues until the total sales cycle and the appropriate product portfolio have been completely covered.

This type of training programme is not ad hoc. It is a planned commitment which is phased to match a consolidated recruitment strategy. A typical training cycle might cover a period of six to 12 months during which time each salesman will have undergone 30/40 days of formal classroom training. This would also be augmented by field-sales guidance, supervision and evaluation provided by the company's own sales management.

The costs related to the training aspects of such an exercise have to take into account both the preparation of the training programme which typically includes both standard and customised modules, and actual classroom presentation. Clearly, there is a wide range of cost depending on content, duration, class size, number of instructors, and more particularly that proportion of product training which can be performed by the computer itself. However, a typical cost per head external charge for a total training cycle should be in the order of £1,000 to £1,200 per salesman, ie, the same level of cost per head that most companies are quite happy to pay in recruitment fees for unproven salesmen.

Generalised ad hoc training can be obtained at a much lower cost. However, it tends to make little impression on the overall performance of a sales force. Effective sales training should enable a salesman to go on to territory knowing exactly what he is selling, to whom he is selling, whom he is selling against, how to gain optimum benefit for his clients from his company and its resources, and have a clear understanding of his company's sales strategy.

There can never be any guarantees about the return to be gained from investing in the training of new people, neither are there similar guarantees related to apparently experienced personnel. However, the "home grown" product tends to be more loyal and less cynical than ready made imports. By and large, people new to the industry tend to be more enthusiastic than the average established salesman. They have fewer preconceived ideas about the scope of the computer industry, its products, its marketplace, and more particularly the benefits of effective selling and hard work.

It may well be that many service and hardware companies continue to limit recruitment to experienced computer salesmen because they do not have the resources to train or time to recruit newcomers. If this is the case, then consistent failure to recruit the quality of salesman they require may yet persuade them to invest in growing their own. In this case, the usage of an external organisation such as Sales and Marketing Services, which can handle both recruitment and training, makes a lot of sense.

On the other hand, it may be that some companies already have educational resources which can be augmented to cater for sales training and personnel staff who can effectively handle recruitment.

Whatever the situation, it is clear that the present shortage of effective salesmen will not be overcome until the industry takes on a firm commitment to invest in the growth of new salesmen, and at the same time flings its presently incestuous recruitment net further afield than its own territory.

Alan Williams is a director of Sales and Marketing Recruiters, part of the Sales and Marketing Services Association of Companies, providing market research, sales training, product promotion, and recruitment services to the computer industry. He has previously worked in sales and marketing with Unilever, Firth Cleveland, IBM, Control Data and UCC.

[redacted]

A THREE-DAY course on the Pafec finite element system has been organised by Compower in conjunction with Pafec Ltd. The course, which runs from July 10-12 at Cannock, Staffs, will concentrate on the practical use of the finite element method and participants will be able to submit and run their own examples during the course. Further information can be had from Mr A. Ogilvy, Technical Services Manager, tel: Cannock 2511.

A COURSE on computer audit techniques is being offered by the City University Business School on July 3-5. It will include lectures, discussions, case studies and practical work, and a video link with the University computer will illustrate some of the lectures. Further information from Pamela Harrison, Marketing — Post Experience Course, Gresham College, Basinghall Street, London EC2V 5AH, tel: 01-606 5031.

A RESIDENTIAL database workshop is to be held by Learmonth and Burchett Management Systems on July 3-7. It is intended for technical staff and technical managers and aims to provide them with a standard design methodology for development database. Further details from Ellen Lee, Course Registrar, Learmonth and Burchett Management Systems Ltd, 23 Newman Street, London W1P 3HB, tel: 01-637 9669.

LOGIC and Microprocessor System Design is the title of a four-day intensive course to be held by Interprojects Ltd in association with the University of Liverpool's Computer Lab on July 10-13, at the University's Greenbank House University Club, Greenbank Lane, Liverpool L17. Its aim is to enable designers and users of digital control and computer systems to work out and implement designs to their own requirements and attain control over the behaviour of their systems. Details from Interprojects Ltd, 29 Church Street, Edmonton, London N9 9DY, tel: 01-803 6896.

AN introduction to modern digital systems is offered by the University of Leeds on September 18-22. Aimed at a wide range of people such as science teachers, medical engineers, computer scientists as well as those from the more obvious engineering categories, the course is tailored to the individual: for example, in the lab work participants can exercise choice in the nature and level of activities. Further details from Dr G. B. Lockhart, Dept of Electrical and Electronic Engineering, The University of Leeds LS2 9JT, tel: 0532 31751.

COURSES on inventory management and control, manufacturing/production control concepts, effective presentation techniques and effective marketing and selling computer services are scheduled by MSS for September, with repeats later in the year. For details of these and others, apply to MSS Computer and Business Consultancy Ltd, MSS House, 49 Chapel Road, Worthing, Sussex, tel: Worthing 34753.

[redacted]

COMPUTERS and Lawyers, an annual conference organised by the Society for Computers and Law, is aimed at familiarising lawyers with the ways in which computers can help them in their practices. It will take place at the Pollock Halls of the University of Edinburgh on June 30-July 2 (Friday to Sunday). For further information contact Mrs Diana Wilson, 6 Lattah Close, Chilton, nr. Didcot OX11 0SU, tel: Rowstock (023 583) 433.

FINITE element methods in their commercial environment is the theme of the Second World Congress on Finite Element Methods, to be held at the Royal Bath Hotel, Bournemouth on October 23-27. It is organised by Robinson and Associates, and further details may be obtained from them at Horton Road, Woodlands, Wimborne BH21 6NB, tel: Verwood (020 123) 4280.

A SCHEDULE of training courses for the MSS General Ledger and Financial Reporting System has been released by Package Programs Ltd. They will be held at PPL's headquarters at 91 Blackfriars Road, London SE1 8HW, tel: 01-633 0121, to which applications for further details should be made.

CLIVE JENKINS, General Secretary of ASTMS, will be speaking on September 12 next on the subject of Computers and the Unions, as part of the BCS 1978 Lecture Series. The lectures will be chaired by Professor Paul Samet, President of the BCS, and will take place at the London School of Economics, Lecture Theatre S075, Houghton Street, London WC2. Tickets: £1 members, £1.50 non-members per lecture, or £4 members, £6 non-members for the series from Rob Chiltern, British Computer Society, 29 Portland Place, London W1N 4HU, tel: 01-637 0471.

Barclaycard banks on muster training

THE visual display unit at the Northampton headquarters of Barclaycard flashed on and promised the watching audience: "At the end of this training session you will be able to change names and addresses ACCURATLY."

Not only advanced technology, but progressive education as well, I thought. But the embarrassed silence was cut short by Mike Webb, the man responsible for plugging the company's staff training into its central computer last year via IBM's Interactive Training System.

"Oh, I don't care a damn about that," he said. "It's not ITS, it's us. The important point is that within four months we had an efficient and economic training system using ITS. We'll finish tidying up our course programs before long. Meanwhile, if accidents like that give students a giggle, so what?"

Considering Webb and Barclaycard's other trainers are — like myself — innocent of any professional understanding of computers and did not get to grips with ITS until a year ago it seems surprising that spelling mistakes are all they have to perplex them. But that is the fact, and *to prove it*, the online *system has already* taught new *job skills* to about 300 people.

Moreover, the training team is looking forward to further development enabling staff to summon up tutorials virtually on demand through the VDUs at their normal places of work in the company's offices in Birmingham, Leeds, Liverpool and Teesside, as well as in Northampton. Then the learning of new jobs will be mingled with the doing of old ones, and much of the flesh-and-blood teaching will devolve on the employee's normal supervisor.

The result will be fewer posts for full-time instructors, but the present team does not seem to care about that either. The reason is probably that other opportunities will be opened by Barclaycard's expansion which, as it happens, was why the company turned to ITS in the first place.

Computers were part of the genetic inheritance of the credit-card system started by Barclays Bank a dozen years ago. Cheques were raised by the quill pen and converted to electronic data processing. But the growth of modern credit-card trading effectively sprang from EDP. It has always been inextricably inter-twined with the company's procedures for dealing both with customers who hold the familiar blue-white-and-gold cards — known to insiders as "plastics" — and with suppliers who accept them. Otherwise, Barclaycard could not have grown from a million cardholders in 1966 to more than four million today.

Before reaching the four million mark, however, the company realised that its way of organising its mainly clerical work would no longer do. Staff were divided into large sections of about 200 people specialising in a certain "function", and sections were divided geographically. Payments sent by cardholders were dealt with on Teesside, for instance, and those who did not pay were nagged from somewhere else. In dealing with any one of its consumers, or of its 105,000 retail and service suppliers, Barclaycard therefore appeared as a split personality of no particular fixed address.

It was decided to change to a new system of "mustering" cardholders into groups of about 200,000 apiece, all of whose exchanges with the company would be handled at the same place by the same company staff. This meant re-dividing staff into groups of only about 35, and teaching them to do the full range of jobs intended or just a few of them. And this in turn threatened to hurl the company's existing training practices into expensive disarray.

"For training under the old functional organisation, we could rely heavily on pitching people into the working departments to learn the job skills by practising them under supervision — what's known in the training world as sitting-next-to-Nellie," said Webb "You see, when you have 200 people in a department, by law of averages you will have about 20 who are born 'Nellies', both glad and able to teach trainees how it's done.

"But there just wouldn't have been enough 'Nellies' to go round when it came to training on the musters. For one thing, there were to be only 35, or thereabouts, at most, in each group. For another, they by and large all had to learn to carry out new tasks; and since most jobs here involve direct access to active files on the computer, if a task is done wrong the odds are that something real will happen like tripling a slow-payer's credit.

"In terms of traditional classroom teaching, that means full-time training of six weeks for each group. Doing that for every muster would mean trainees living away from home for ages which wouldn't help morale, and think of the hotel bills. The cost of that kind of exercise would be colossal."

So Barclaycard looked for a better way. But although the company would not have existed to employ Webb without the computer, he did not call in its aid immediately. Perhaps the thought was blocked by the flesh-and-blood teacher's typical complex about encouraging electronic self-replacement.

The first three musters were trained in this way but the bank's management services department was looking into ITS* with IBM who as suppliers of Barclay's computers are constantly in touch with the group and talked to Webb about its advantages.

"I was sceptical," he said. "But when we looked at it, there was no question. If the projections had suggested a 50 per cent saving on likely traditional classroom costs, I might have needed more proof. But the comparative costs, spread over two years of rental for ITS, came to only a tenth of the expense of the other method. We just had to run a pilot using ITS.

"But we had no programmed learning experience. So we went to Sheffield Polytechnic's Industrial training unit where Quentin Whitlock was asked to adapt their program writers' course for computer based training."

And as spring turned to summer last year Barclaycard employees got down to the basics of translating job skills into programmed courses. In 10 days they covered among other things mathetic analysis. That, by the way, is not another spelling mistake. It is a way of breaking down jobs into series of fundamental operations, each consisting of a "stimulus" and a consequent "response". The stimulus of a telephone buzzer elicits the response of raising the receiver, and heavy breathing at the other end provokes, 'Is that you Bert?', and so on.

The course over, the trainers sorted out the tasks involved in the company's six main grades of clerical work. "We found we should have done it long before," Webb commented. "The task analysis helped us a lot in itself. For instance, we had always assumed that the lowest two grades were identical. The analysis showed that while they were similar in some ways, there were several important differences."

The next step was to draw up a sort of route map of the skills involved, ordering them so as to show which tasks had to be mastered before someone could go on to more complex level of work.

Meanwhile, Barclaycard's trainers had taken a computer-based training course on writing courses specifically for use with ITS. It is perfectly possible for people with no professional knowledge even of computer language to create adequate learning-sequences of instruction, practice on a simulated task appearing on the visual display screen, testing of the ability acquired, and relevant comment.

The only part of the training which this course structuring facility (fill-in-the-blanks worksheet approach) does not address is the practice and consolidation which students receive at the end of each procedure being taught. In the past, Barclaycard used a copy of their online system and students were able to use any of the online programs without the risk of updating real files.

However, this was expensive to run, difficult to schedule and often the trainers were unable to find suitable accounts to illustrate certain teaching points. But IBM's Mike Dowsey — who went in to give expert help to the Barclaycard project — used ITS's computer language Coursewriter to produce a simulation of the Barclaycard online programs within ITS and provide the trainers with the facility to build whatever accounts they required to illustrate different situations.

From the student's point of view, he proceeds straight into the practice and consolidation session from the teaching material and works through the set problems. All messages he receives are the same as in the real system and when he finishes he enters the word "out" which takes him back to the start of the teaching material for the next procedure.

Some of the trainers became interested in the Coursewriter language, especially as the worksheet approach automatically generates this type of program code.

"The computer fogged us a bit at first," said Kathy Billam, another of the trainers who by now had been semantically dignified by the new job-title of course-authors. "But we soon picked up the basic jargon and it seemed to knit us together."

One of the IBM muster display terminals used by Barclaycard to teach trainees. Already the Interactive Training System has taught new job skills to about 300 people.

By MICHAEL DIXON

Education Correspondent and jobs columnist of the Financial Times

As summer reached its peak the team moved to authoring in earnest, although still with the support of Dr Dowsey. They opted for a combination of self-instruction at the VDUs in the training rooms of the various centres, laced with periods of traditional class-type teaching.

First came a two-week course of essential background in which the interactive facility was used, initially to teach the trainees how to use screens and keyboards. Next came programs covering the whole range of tasks required of the most junior staff grade, which also constitute the foundations of the more senior work, and consolidating learning with practical sessions using simulation of the Barclaycard's systems programs.

About a month before the scheduled start of ITS training proper in the October, Webb decided to try part of the new training course instead of an otherwise traditional course in Leeds. Although feeling he already had a critical career investment in the success of the new venture, he twice reached cancellation point as the system became possessed by devils far beyond his layman's understanding.

Fortunately the professional exorcists arrived in the nick of time, and now eight months later Webb has just left training behind him for a new department, with ITS shining brightly on his record. So has Mrs Billam. But in spite of the agonies of establishing the new venture on a sound, albeit still unpolished foundation both clearly regret parting from it as it moves towards the rewarding stage of on-demand use in the normal workplace.

Although asked separately for their conclusions from the experience, they produced answers which had an air of being spoken in chorus.

"Even after we were committed to it, I still thought that only 60 per cent of the training could be done by ITS," said Webb. "But I've realised that in general there is little that we couldn't put on to it. The trainees need someone to provide clarification, but their normal supervisor could soon learn to do that and, as a last resort, they can seek help from the course author."

"Initially," said Mrs Billam, "I was sure that a large percentage of this training couldn't be done on it. But we've already put much more than that into the system and done it with confidence. At first I was worried too, about taking away the classroom discussion. But it can work. Provided someone is available to explain things occasionally, ITS could do the lot where training here is concerned.

"And getting it to do the lot is within the scope of Barclaycard staff now, I think. It's remarkable how soon we were competent when none of us had a computer background if you don't count experience of using terminals. If you'd asked me before if it would be possible, I don't think I'd have said yes."

Said Webb: "Professional computerism's still a mystery to me. We still can't do Coursewriter language, for instance. But tell me some job here that you want taught through ITS, and we'd write you some sort of program overnight. It wouldn't be more than makeshift for a good while afterwards, but it would serve for the time being. That's the way we've had to work, and it has been one of the wrenches of the change — going live before you'd developed the course to professional standards.

"I would say there was nothing we would be shy of putting on because we lack the competence. If we decided to keep something off, it's because it simply cannot be justified. Some procedures are handled by only a few staff throughout the company, and it's cheaper to train people for those in traditional ways. But for the larger numbers it's well worth while. So far, we've averaged 58 hours of preparation for each hour's training on line. That compares with an estimate by the National Development Programme for Computer Assisted Learning (NDPCAL) not long ago of 75 to 100 hours to one."

What about the effect of the changes on the trainees?

"When we've given them questionnaires to fill in," said Webb, "some have ticked yes and some have ticked no, and when we've put the same question in two different ways, some have answered both yes and no. But on the whole they are for it. Most of the younger ones are quite excited by it, and the older ones like the way the system allows them to get things wrong without showing them up before the striplings in the class. We've also had two people to each terminal. It was forced on us for a bit by power cuts. It worked all right, and in some ways the need to agree in advance what answer to type-in seemed to produce better learning. But for the moment, I'd still bank on one per VDU."

Said Kathy Billam: "The proof of the pudding is that I'm going to a new job in mustering, and a lot of it is strange to me. But some of it is available in our ITS programs. I've used those and they worked on the whole enjoyably. It's good to have the chance of mastering the skills of new task before starting the new job."

*Interactive Training System. Since mid-1977 the functionally equivalent IBM Program Product, Interactive Instructional System (IIS) has been available on a wider range of IBM systems.

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The easiest way to be cynical in computing is to maintain that any "revolutionary advance" in technique was in fact described about 20 years ago, says MALCOLM BALLANTINE (pictured right). With the coming of word processing, the effects of computers on management structure are being looked at more and more. It is a topic for which it is worth looking at papers written 15 to 20 years ago, of which, perhaps, little notice was taken at the time.

How computing will affect management structure

IN the race to keep up-to-date it is too easy to ignore anything written before 1974. Perhaps this is the reason that the easiest way to be cynical in computing is to maintain that any "revolutionary" advance in technique was, in fact, described about 20 years ago.

With the coming of word processing, people are looking increasingly at the effects of computers on management structure. This is certainly a topic for which it is worth looking at papers written 15 to 20 years ago.

When the potential effects of computing on management structure were first recognised a great deal was written of which, it often seems, very little notice has been taken. Looking back, perhaps the most bewildering aspect of what was written was the vast range of possibilities which were predicted. Now that our knowledge of the dynamics of organisations is a little more sophisticated it makes interesting reading.

One of the most thought-provoking pieces was written by Harold J. Leavitt and Thomas L. Whisler, and appeared in the Harvard Business Review in late 1958.

To Leavitt and Whisler, there is an essential aspect of organisations to be considered. This is the distinction between the performance of the tasks to meet the organisation's objectives (in a factory, production) and planning those tasks.

In the traditionally organised firm, planning is the prerogative of the higher levels of management. Looking forward to the 1980s, Leavitt and Whisler saw that "information technology" — rationalising decision-making by means of computer-based operations research methodology — would have a profound effect on middle and top management. This would show in a number of ways:

● The boundary between planning and performance would move upwards — top management taking on far more of the planning responsibility while most middle management jobs would either disappear or become routine.

● At the same time the trend towards decentralisation would be reversed, because of the movement of planning towards top management.

● The remaining middle management jobs would as a result either move downwards in status or in a minority of cases, upwards towards top management.

● The effect of this would be to draw the line between the top of the organisation and the remainder in a clearer way than ever before.

To summarise, then, middle management levels would largely be squeezed out, leaving a somewhat enlarged élite to control the organisation. Joining the élite would be a number of expert groups — the information technologists themselves, for example, who together with other experts would supply manpower for many of the highest level jobs.

Not everybody shared this view. Two years later, Melvin Anshen also writing in the Harvard Business Review, gave an account which contrasted markedly. Anshen criticised Leavitt and Whisler's logic on two grounds: that essentially they were arguing that because some middle management decisions could be effectively programmed, all were amenable to information technology, and secondly that they assumed the man-machine relationships which were to be set up were relatively problem-free.

He looked further at management decision making using a five-way classification:

● "Setting the agenda" — deciding which problems needed solving;

● "Goal choices" — in solving particular problems, deciding what the objectives should be;

● "Resource allocation" — scheduling of materials and workloads and budget administration;

● "Implementation" — putting decisions into operation;

● "Making evaluations" — do other decisions need revision?

Out of these different classes of decision, Anshen argued that only resource allocation showed sufficient structure to enable the effective use of programmed decisions. Middle managers, on this view, are safe. At the same time, programmable decision making is generally greedy of attention and time. The overall effect should therefore be to enrich the job of management by allowing greater attention to be given to more interesting and demanding unstructured problems. Provided that the problems of man-machine relationship can be solved, the jobs of middle managers would come to resemble those of top managers far more, although change would not be as rapid or as extensive as many people predicted.

Two articles then, presenting different points of view which predict almost opposite outcomes. Almost 20 years later, either outcome still seems possible and, in the immediate future, moves towards either outcome certainly are possible.

Today, however, they can be identified as representing different management styles. These have been identified by many management theorists but the best known analysis is Douglas Macgregor's division into "Theory X" and "Theory Y."

Theory X is the style of management which is highly directive. It depends on a rigid hierarchical structure and a precise definition of jobs and tasks. It is thus characterised by centralised control and a strong dependence on control by authority.

Theory Y, in contrast, depends on the commitment of individual employees to the organisational objectives. It is therefore more participative, emphasising personal involvement. It depends on the self-motivation of the individuals in the organisation and it is less dependent on precise definition of jobs and tasks.

Theory X and Theory Y represent the extremes of a spectrum of possible management styles. Neither extreme can be regarded, out of context, as good or bad. An extreme Theory X style works well with a relatively static organisation and is almost essential for the administration of rigid, complex procedures. On the other hand, it offers little recognition to the individual and copes very badly with rapid change.

An extreme Theory Y style offers considerable flexibility and can therefore cope well with rapid change but, while individuals get much more recognition and opportunity for personal

By Malcolm Ballantine

● Turn to Page 53

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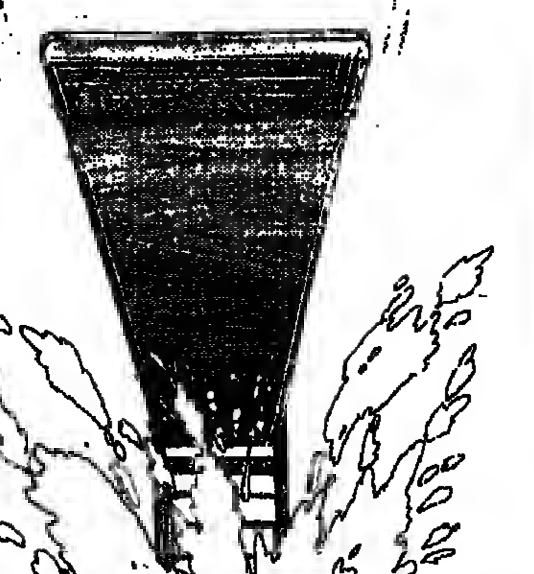

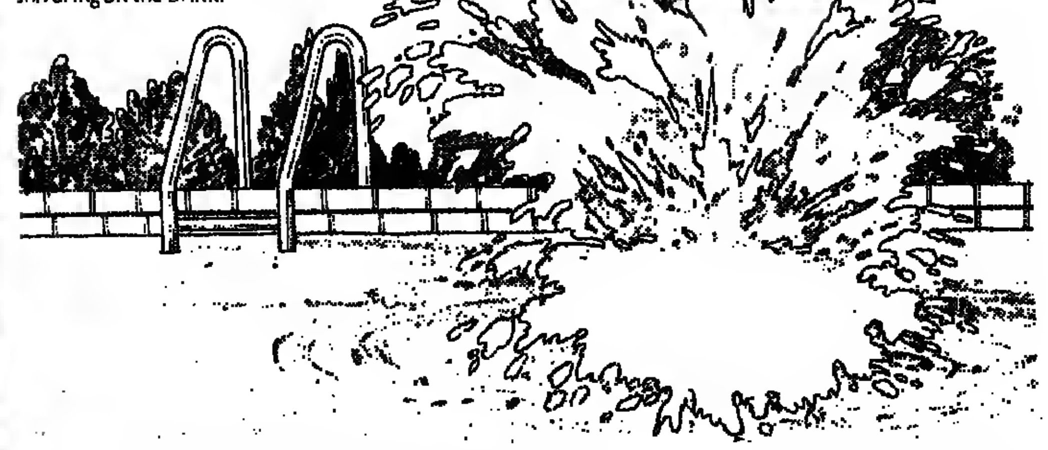

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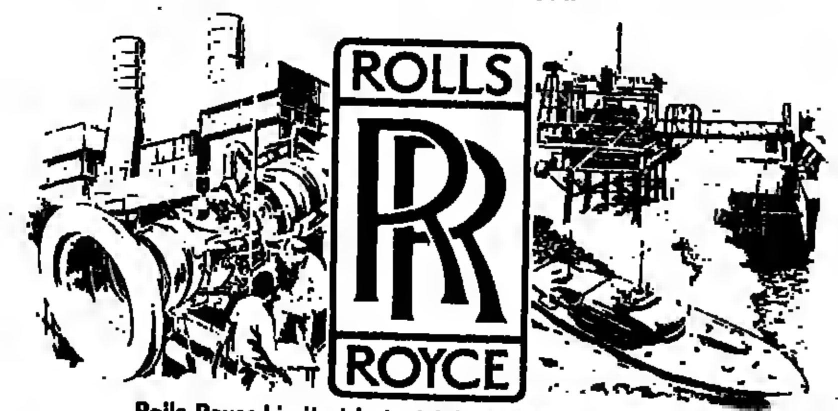

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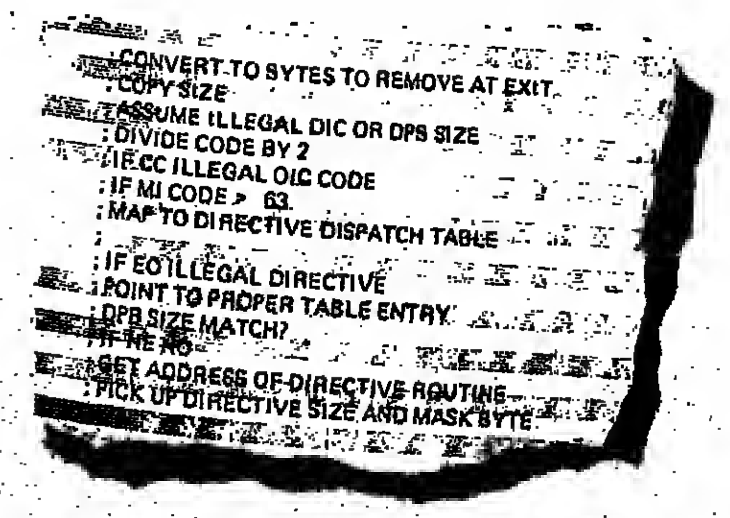

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Surrey — Up to £6,500

Our client, a well established computer services organisation, is about to form its own computer maintenance group and has vacancies for two engineers. The existing mainframe installation will be expanded later this year to include DEC 10 systems.

Applicants should have at least two years' experience of the maintenance on the DEC 10 or PDP 11, although a background of similar hardware would be considered. Knowledge of software, diagnostics, unit and board repair is obviously essential.

This is an ideal opportunity for career development since responsibility and promotion will be given at an early stage.

Excellent basic salaries, shift call out allowances, LV's and other generous fringe benefits, including relocation where applicable. Contact: Jim Baker

Analyst/Programmer

City — up to £6,000 + 2½% mortgage

A specialist city bank has retained us to recruit an Analyst/Programmer to help in the development and maintenance of a highly sophisticated real-time foreign exchange system.

The ideal candidate will have experience of programming in MACRO-11 under RSX-11M on PDP11-/70 in a financial/banking environment.

However, if you have good, solid experience in programming and design work in the financial field and would welcome the opportunity to be retrained, then please apply immediately.

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For further information on any of the above vacancies please contact the appropriate consultant.
If your qualifications do not match the above positions but you are seeking other opportunities please contact us anyway.

JAMES BAKER ASSOCIATES, International Personnel Consultants
16 Maddox Street, London W.1. Tel: 01-491 4478

Data Processing Staff

£3,000 - £5,500 p.a.

Leading life assurance office, Salisbury, Wilts.

We are a very successful and forward-looking life office dedicated to intense computer involvement with on-line applications for all user departments, including New Business, Policy Servicing and Actuarial Departments. We need experienced, ambitious people at various levels to strengthen our small development team.

We can offer you really stimulating and challenging work using the latest techniques, with good opportunities for progress and professional development. As a bonus you can live and work in Salisbury, a cathedral city in a pleasantly rural area, convenient for Bournemouth, Poole and Southampton.

Two Systems Analysts (Up to £5500)

Job: Systems development at business specification level and subsequent implementation of new systems

Our requirements: Education to degree or 'A' level standard, five years DP experience, two as analyst. (Good background at business systems level).

Senior Programmer (c. £5000)

Job: Advising on computer system design.

Our requirements: ICL 1900 COBOL experience using George 2, 2+ or 3. Communications background (e.g. DRIVER). Knowledge of database and structured programming helpful.

Computer Operators

(up to £3000 including shift allowances)

Our requirements: Age at least 20, educated to 'A' level standard. Minimum of one year's operating experience on disc based ICL 1900 using George 2 or George 2+.

In addition to a good salary we offer excellent fringe benefits.

Please apply quoting reference No. HO/24 to:—

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Applications are invited for the following posts:

Faculty of Business — Barking Precinct
Department of Systems and Computing

Lecturer II
Business Administration

To teach in the field of business administration, organisation, or policy. Some knowledge of computing applications would be an advantage. Applicants should be graduates with an interest in new developments in teaching methods and in part-time education.

(Ref. S/BE 118A)

Lecturer II
Systems and Programming

Applicants for this post should have recent commercial, industrial or teaching experience in Operating Systems and Programming in COBOL. Appropriate academic qualifications should be held and experience of ICL 1.900 series would be an advantage.

(Ref. S/BE 118B)

Salary Scale: Lecturer II: £4,101-£6,559 per annum (Plus applicable London Allowance)

The above posts are available for appointments as at 1st September, 1978.

Further details and application form from:
The Senior Academic Personnel Officer (2)
North East London Polytechnic
Forest Road, London E17 4JB
Telephone: 01-527 2272 (Extension 20)

Closing date: 30th June, 1978.

NELP North East London Polytechnic

2903

Dalgety

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c.£5,750

Dalgety Agriculture Limited control its Arable trading activities from its office at Biggleswade. An ICL 2903 Model 40/38 with 2 x EOS 30 Discs will be delivered in September and will take on the current bureau based systems to give a complete in-house facility.

The new post of Operations Manager will carry responsibility for the processing of the various systems already developed and for implementing new systems as they become available.

Full involvement in the commissioning period together with the recruitment and training of additional staff is envisaged.

Applicants should be able to demonstrate familiarity with the 2903 range of equipment and associated peripherals. Experience of supervision would be an additional advantage but is not essential if qualities of leadership can be displayed.

Please apply by letter or telephone to:
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SNR. OPS/OPERATORS
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A major IBM 370/OS user is offering really excellent perks including high salary and paid overtime plus paid removal expenses. You must have a minimum 1 year OS experience though.
CW 24/1 Patricia.

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You have only 1 year's commercial experience? Then you are in great demand. We have a large selection of first-rate companies who need people like you. Some offer mortgage assistance to the right candidates after short period with them.
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Address	Telephone (home)
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	Position required
Age Marital status	Salary required
Period of notice Children's ages	Areas required
Car owner / driver Foreign languages?	Willing to move? Within UK: Yes / No Overseas: Yes / No
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Time period to nearest quarter year: Operating Programming Sales / other

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Assess your experience: S = some A = adequate F = full (leave blank if not relevant) of the following:

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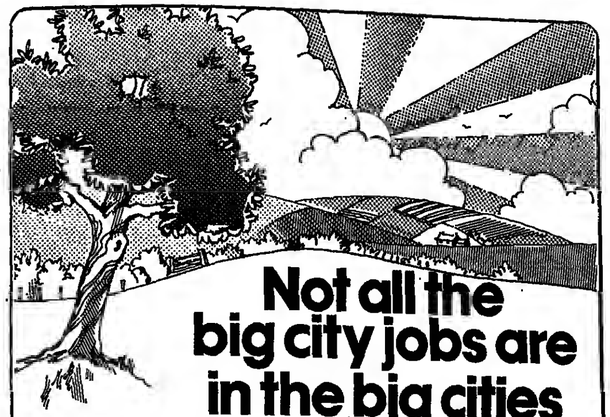

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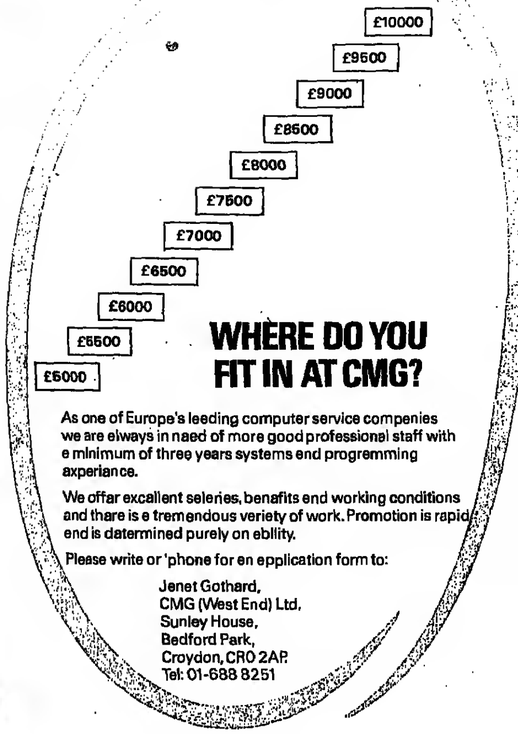
Our offices in Haywards Heath are in a modern building two minutes away from the station. Just a few minutes more and you're into some beautiful country (When we say our grass is greener, we mean it.).

Currently we're looking for
Systems analysts and Programmers
Salary to £5,700 p.a.

Please ring or write to Sally Luthman,

Computer Data Processing Ltd.,
Perrymount Road, Haywards Heath, West Sussex.
Tel: Haywards Heath (0444) 59188.



WHERE DO YOU FIT IN AT CMG?

As one of Europe's leading computer service companies we are always in need of more good professional staff with a minimum of three years systems and programming experience.

We offer excellent salaries, benefits and working conditions and there is a tremendous variety of work. Promotion is rapid and is determined purely on ability.

Please write or 'phone for an application form to:

Janet Gothard,
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Sunley House,
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Croydon, CR0 2AP.
Tel: 01-688 8251

MAKE A MOVE TO COVENTRY

"SYSTEMS AND PROGRAMMING OPPORTUNITIES"

Our client a major manufacturing company based in Coventry wishes to recruit the following D.P. staff to augment their existing team.

At present the company are using a Univac 9070 running under O.S.4. Later this year a second machine will be delivered operating under V.S.9.

They are presently involved in the complete redevelopment of several of their major systems, using on line V.D.U.'s.

Training courses are available for candidates without Univac experience.

PROJECT LEADER to £5650
- At least four years' commercial systems including Production Control
- The ability for solving business problems
- Able to motivate and communicate effectively

SENIOR ANALYSTS c £5000
- Two years' commercial systems
- The ability to work independently
- Knowledge of on line techniques

PROGRAMMERS c £4500
- At least 12 months COBOL
- The desire to progress into systems
- The ability to work in a team environment

Contact: Graham Aston, M.E.C.I.
MARTINS COMPUTER SERVICES
First Floor, Western House, opposite Albany Hotel, Broadcasting, Queensway, Birmingham B5 4HG. Telephone 021-643 2111. 24 hour answering service. Evenings and weekends 021-464 0931.

We are now able to interview until 6.30 p.m. and Saturday morning by appointment.

Large company benefits apply including: Flexi-time; Pension Scheme; Subsidised Canteen; Sports and Social Club; Relocation Expenses; Etc.

Although this company is situated in Coventry, it is easily accessible to the M6 motorway with low cost housing nearby.

Berkshire + Relocation

Our client is a U.S. multi-national producing and marketing a complete range of mini computers to scientific and commercial users. Growth is fastest in the commercial area, and in order to provide high quality software products and environments to commercial users, they are seeking additional Software Programmers to strengthen their development activity.

The European Headquarters of the company is located in Berkshire, including one of the two software development centres in the world. Their products are produced for the world market and, as might be expected of an organisation of this stature, professional standards are high and the working environment congenial.

The people sought will have approximately 3 years' software development experience at Assembler level and will have an unparalleled opportunity to enlarge their practical experience on compilers or data base systems. They will receive excellent fringe benefits and salary up to £7000.

Enquiries concerning these openings, please, to Tony Baker on 01-499 4501.

RW 24/5

★ Opportunity for Early Promotion ★

Our client is the UK subsidiary of an American company engaged in the manufacture of interactive terminals.

The parent company has a well established computing function, and the UK subsidiary is now about to install its first ICL 2903. As a result, they now wish to recruit a capable and experienced Cobol Programmer to handle the implementation of a wide variety of accounting applications, some of which will be based on systems operational in the USA, and others which he will create himself.

The company's DP plans envisage a continuous growth and development for at least 4-5 years, and as there are currently no plans to appoint a Systems or DP Manager, promotion prospects could be particularly good for the Programmer appointed.

In addition to practical programming work, there will be early involvement in systems design and you can expect to be working closely with the US computer operation in Texas.

Enquiries in the first instance by letter to Tony Baker on 01-499 4501

RW 24/6

hutchinson-scoggins recruitment

10 Dover Street London W1X 3PH Telephone 01-499 4501

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A vacancy has arisen for the above appointment in our Electro-Data Processing Department.

It is expected that the appointed applicant will be able to develop programmes for the company, and create and analyse new programmes for parts of the organisation still in the process of computerisation.

The work involves general co-ordination of all E.D.P. requirements including, in some cases, liaison with Bureaux, although the company has intelligent terminals connected via direct line to the Mainframe Computer at our head office in Germany, which offer keybatch and interactive facilities.

During the process of development frequent visits to our parent company in Germany will be expected.

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London College of Printing
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Senior Lecturer in Computer Technology and Information Systems

The Senior Lecturer is required from 1st September, 1978 or as soon as possible thereafter to lead developments in Computer Technology in the College.

This is a particularly challenging post to those who have the necessary drive and enthusiasm, both to be responsible for computing throughout the College and to identify and expand those areas of the College's work where computing is applicable.

The successful candidate should ideally be a graduate in Computer Science and/or a member of the British Computer Society and will be capable of teaching within Honours Degree programmes and furthering research in this area.

Appropriate industrial experience would be advantageous.

Salary in accordance with Burnham F.E. Report £6051-£7065 (bar - £7572, subject to formal approval, plus £4D2 Inner London Allowance.

Further details of the post and an application form, returnable within 14 days may be obtained from the Senior Administrative Officer, London College of Printing, Elephant and Castle, London SE1 6SB; Tel: 735 8484 (Ext. 227).

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The following vacancies are at a computer centre providing an internal bureau service for a software house. Current hardware includes an ICL 2970 as well as two ICL 1903A and an ICL 2904 supporting a terminal network.

2900 Systems

The Support Technicians' function is to support and maintain all 2900 services provided by the centre and to provide technical support to operations units and users.

Candidates will probably have 4 years' experience in a computer operations or systems and programming environment with one year in a 2900 VME support role. Consideration will also be given to less experienced candidates with good potential and a minimum of 1 or 2 years' programming experience with a degree or HND qualification. They must have a personality suited to a support function and must be able to communicate clearly, orally and in writing. They must be keen to further their technical knowledge by learning constantly about new products and development units' work. **Ref: 520/CW/Renée Nute.**

1900 & Small Systems

The Support Technicians' function is to support and maintain all 1900 and small systems services provided by the centre and to provide technical support to operations units and users.

Applicants are expected to have a minimum of 1 or 2 years' programming experience with a degree or HND qualification, although 4 years' experience in computer operations and/or a systems programming background would be preferable, ideally to include one year in a 1900 George III support role. They must be capable of absorbing technical information on standard and new products and must be able to respond to support demands at all times. They must have very good communicating skills and must be suited to working in a servicing environment. **Ref. 521/CW/Renée Nute.**

If your experience is in line with the above requirement, please telephone or write to Renée Nute on 01-242 9356 (day) or 01-874 6372 (evenings/weekends).

Computing Services Association

SECTION ENGINEER
(COMPUTER)

£5,389-£5,950 **Guildford**

For the Surrey Sub Unit of our County Engineer's South Eastern Road Construction Unit. Applicants should preferably be qualified Civil Engineers with Computer Operation experience to manage a small section controlling a batch terminal.

This is a temporary appointment for the duration of our motorway contracts (initially for a period of two years).

Application form from County Engineer (Post No. 119), Highway House, 21 Chessington Road, West Ewell, Epsom, Surrey. Tel: 01-394 1788, Ext. 215. Closing date: 26 June.

SURREY COUNTY COUNCIL

Doncaster Metropolitan Borough Council

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SYSTEMS & PROGRAMMING MANAGER

PO1 (1-5) £4685-£5250 plus £520 supplement

To be responsible to the Deputy Data Processing Manager for all activities concerning the development and maintenance of computer systems, specifically those relating to the treasury and programming functions. Applicants should be members of the British Computer Society or equivalent and have a minimum of 4 years' experience in systems/programming together with experience in the control of staff.

The duties of the post may subsequently be amended pending the LAMSAC report.

Assistance with housing and removal expenses in appropriate cases.

Application forms and further details from Chief Executive's Personnel Section, 2 Priory Place, Doncaster (tel. 20321). Closing date 29th June, 1978.

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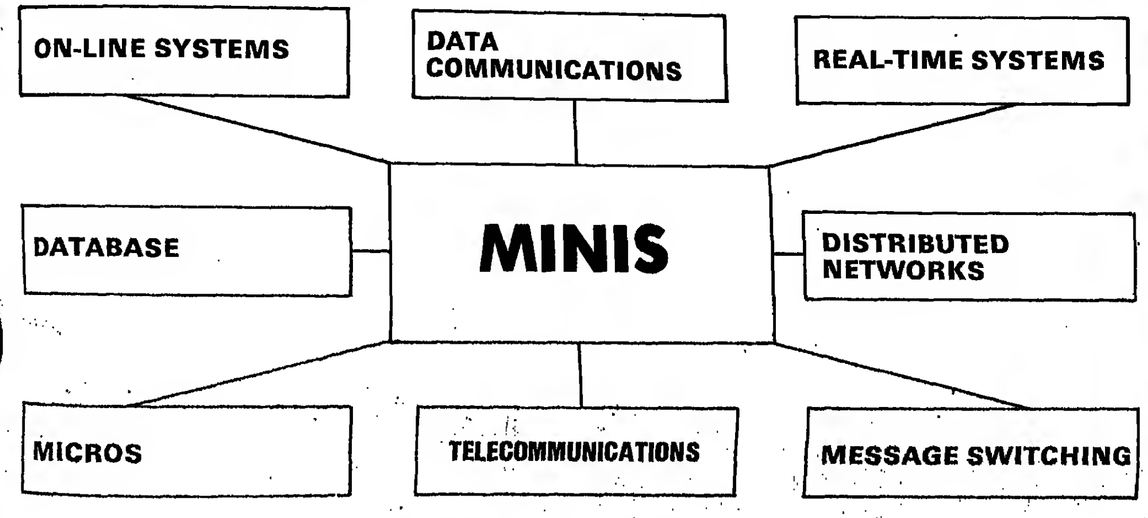

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Projects currently engaged upon are extremely varied and comprehensive in terms of the use of mini-computers and involve interesting and often complex systems.

Telephone Bill Seymour or Andrew Ellis for further details regarding positions available; and background information about living in Holland.

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BM Seymour, Portland House, UK Office,
UK Office, 4 Great Portland Street, London W1N 5AA England. Tel: 01-580 3754

Andrew Ellis, Sarphatistraat 36, Amsterdam, Holland. Tel: 020 264664/264082

International Small Systems Project Manager

MAJOR INTERNATIONAL BANK

Salary: Up to £8,000 per annum

Plus normal banking fringe benefits

We ere specifically looking for someone with experience of NCR 299 end 399. Our client is e major Internetional Bank instelling e number of eccounting systems throughout the world, covering such erees es the Middle Eest, Indie end the Fer Eest.

We ere looking for someone who hee experience of the herdwere mentioned, ideelly, someone who hes elreedy worked for the relevent menufecturer, who would enjoy working for e significent period of time oversees. You would be totelly responsible for instelling e peckege thet hes elreedy been developed but mey require some modificetion, end you will heve to spend e lot of time working on your own. Therefore, you will be e self-sterter, end not someone who hes to constently "refer to bess" for instructions.

Your ideel beckground would be e date processing one, then banking but more importent, experience of 299 or 399. Quite honestly, if you do not heve the letter experience you will be westing your time in applying.

The opportunities ere very good indeed, our clients regard this as e treining bess for ebout two yeers end thereefter, promotion is almost certein if you perform well. You should be eble to demonstrate between two end three yeers' experience of working on the relevent herdwere. You will heve been responsible for at leest one series of systems end will be enxious to move into e lerger dete processing erea which this position will eventuelly leed to.

The internetionel trevel eepect is either ettrective or it isn't, you heve to be prepered to "peck your begs" and go et short notice, therefore, if this is e deterrent this isn't for you. However, if you feel you heve the drive, tha tact (most importent), enthusiesm end technicel ebility, we would like to meet you.

The fringe benefits are excellent, they include e low interest mortgege, free medical services, non-contributory pension end e subsidised luncheon.

Please apply to John Goldsmith, Ref. 1686/CW.

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Data Processing Manager

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Excellent Income Package

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We want to meet someone who has spent some time either here or in another Western country, learning the "tricks of the trade" of data processing. Probably now, you will be working as a Senior Systems Analyst or Project Manager with about six or seven years' date processing experience. The ideal specification will be someone who has come from programming then into systems and before that, will have achieved a professional qualification, ideally in the U.K.

Within the Bank's date processing unit — this is "number one in Pakistan", we are looking for someone who doesn't sit in his office all day hoping things will get done, because they don't do they? You will ensure that they do! Certainly, initially, you will have to lead from the front from the technical point of view and you will be very much dependant upon your own resources. However, as you progress successfully, your own responsibility will become much wider and eventually, encompass a wide renge of locations.

The position offered is a rare opportunity, we do not remember seeing a comparable position, therefore, we are looking for someone who is prepared to relocate back to Pakistan, later if necessary, to travel elsewhere in the Middle East for our client, but first and foremost, get the new operation off the ground in an impressive way.

Please apply to John Goldsmith, Ref. 1683/CW.

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Research & Development - Brighton

ITT Creed is a world-leader in the design and manufacture of teleprinter and data-transmission equipment. As a major division of ITT Business Systems, Europe's largest telecommunications group, innovation and sophistication are the keys to our continuing success in this growth market. Which is one of the reasons why we invest heavily in software research and design for new products.

This is the environment we are offering to the Software Engineer – a man or woman – who joins us now. The team is young and highly talented, and you will be expected to match up on both counts.

You will have individual responsibility for developing mini and micro-based software systems. So you must have two years' or more programming experience in Assembler, preferably with micro-computer applications.

Although an advantage, shop-floor experience of advanced automation/control systems is not a necessity. In terms of formal qualifications however, you will need a degree or HND/HNC in Computer Science or a related subject.

A distinct advantage would be some experience of hardware and computer logic.

Salary is very attractive, and a good range of company benefits includes a staff restaurant and a progressive sick pay scheme.

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Please write or 'phone for an application form to: John Heath, ITT Creed Limited, Hollingbury, Brighton BN1 8AL. Tel: Brighton 507111 ext. 3523.

ITT Creed Limited

ITT

SYSTEMS ANALYST c. £9,500
OSSETFORD
A graduate with two years' experience in a commercial environment as a programmer or analyst is required for this position. A mature personality with a practical, analytical approach to work on accounting and planning applications, assisting users and implementing new systems.

PROGRAMMER/ANALYST c. £8,000
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This is an ideal opportunity for a programmer wishing to get involved in systems development work. International Company, requiring a good programming background with RPG 11 experience.

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To work on commercial/business systems using mini-computers. At least one year's high-level or low-level programming language experience will be considered, not necessarily on minis.

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If you have at least one year's recent experience of writing in ASSEMBLER, preferably on mini-computers this vacancy will suit you. Experience of working on system software for a multi-processor system with communications and database is an added advantage, which will be well rewarded.

Please phone or call in for more details and an application form.

AMES PERSONNEL
TELEPHONE: 01-767 0611

London Borough of Enfield

Systems Analysts (2)

£4630 - £4900

(Phase III Award Pending)

We wish to fill two posts that have been created to assist with the Borough's development into "on line" systems. Applicants should have a sound background in programming and systems analysis with some years' experience of either public or private sector data processing.

These posts offer a varied and demanding job in a modern office with attractive surroundings bordering rural Hertfordshire.

If you would like further information ring Ian Gray, 01-366 6565, ext. 2626.

An application form is available, upon receipt of sae, from the Borough Treasurer, PO Box 54, Civic Centre, Silver Street, Enfield EN1 3XF. Closing date 30th June, 1978. Please quote reference ORA/191.

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Microprocessors Software Computer Aided Design

(Up to £7,000)

The Company's Advanced Development Division is a forward looking design group, exploiting L S I technology in the application of stored programmed control to telephone switching and also the development of other advanced products for the telecommunications industry in both the Switching and Subs-Apparatus areas. The Division is situated at the Company's modern new headquarters in Malmesbury, Wiltshire

SENIOR SOFTWARE ENGINEERS

Required to work in close collaboration with L S I circuit design engineers to produce new microprocessor based products. Applications are invited from Analysts Programmers preferably with Intel 8080/85 and multi-computer experience gained in the electronics industry. A degree in a relevant discipline is preferred but evidence of the completion of real time systems properly documented using Coral or Assembler language together with at least 5 years experience in this field is more important (Ref ADD/WT)

SCIENTIFIC PROGRAMMERS

Required to work on the development of software tools for CAD, design automation, automatic testing and advanced graphics systems as applicable to the realisation of L S I circuit design. Successful applicants will be working on computer types SEL 32 and DEC 2050. Vacancies exist at both Intermediate and Senior levels. Applications are invited from self motivated and creative people with experience of both Electronics design and Fortran programming. The successful applicant will have a degree in Electronics or Computer Science (Ref ADD R B)

These positions are open to suitably qualified men and women. The Company which is part of the multi-national Philips Group, offers the full range of benefits including subsidised canteen facilities, and discounts on group consumer products, etc. Generous relocation expenses will be paid where appropriate.

For further information 'phone the Personnel Department on Malmesbury 2121 or write with full details of education and career to date (quoting the appropriate reference) to the Recruitment Officer, Pye TMC Limited, Swindon Road, Malmesbury, Wiltshire, SN16 9NA.

PYE TMC

CONSULTANCY

West London/City
Mainframe and Minis
To £8,000 + Profit Share
+ Expenses

A successful medium-sized DP consultancy has career opportunities for consultants in its mainframe and mini divisions.

For the mainframe division, we expect programmers to have at least two years' experience of COBOL, PL1 or MARK IV. IBM experience would be preferable, but full re-training will be given. Analysts should have two to three years' experience in systems analysis and design with a programming background — any additional skills such as teleprocessing or data base would be useful.

Candidates for the mini division should be experienced in programming commercial minis such as DG, HP or DEC, using COBOL, FORTRAN or ASSEMBLER.

The company offers high earnings, a friendly working environment and the opportunity to work on a wide variety of systems.

FOR FURTHER INFORMATION, PLEASE CONTACT MARK IRENS, QUOTING REFERENCE NUMBER CW/36/1.

HUTTON EXECUTIVE SELECTION LTD.
HUTTON HOUSE,
HUTTON STREET, LONDON EC4Y 8HP.

TELEPHONE: 01-353 7141 (24 HOURS)

Hutton
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BASIC TO £8,000 + 12 MONTH GUARANTEE
GENEROUS CAR ALLOWANCE AND EXPENSES
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Applicatione are invited from either esteblished managere or senior sales executives ready to move into management, to join one of the foremost menufacturere of distributed processing systems in Europe. An excellent salery and expensee peckege will be peid for the person who can fill this key vecancy.
Reference CW 36/2

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DISTRIBUTED INTELLIGENCE/MINI COMPUTERS

Applications are invited from esteblished executives with proven records of selling successfully against quotas. Sound commercial experience in the mini/mainframe industry and good applicetione experience in teleprocesing environments are particularly useful.
Reference CW 36/3

APPLICATIONS WILL BE TREATED IN THE STRICTEST CONFIDENCE AND SHOULD BE MADE TO ROB BOWER, ADVISING DIRECTOR. PLEASE TELEPHONE WHERE POSSIBLE.

HUTTON EXECUTIVE SELECTION LTD.
HUTTON HOUSE,
HUTTON STREET, LONDON EC4Y 8HP.

TELEPHONE: 01-353 7141 (24 HOURS)

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SPECIALIST RECRUITMENT CONSULTANTS

Portsmouth Polytechnic

SCHOOL OF ARCHITECTURE

Computer Programmer

Post 464 (A)

A specialist is sought to create and develop computer aided architectural design programs within the School. The department has just acquired a Tektronix 4014-1 interactive graphical terminal linking to the Polytechnic's ICL 2960. The successful candidate will implement existing programs and, in collaboration with staff, develop new programs in areas of architectural education and design including computer aided learning, building utilisation, decision aiding, and ecoustic, lighting and thermal design science.

Salary Scale: T3/4. Up to a maximum of £3,702 + £502 supplement per annum.

DEPARTMENT OF GEOGRAPHY

Technician for Computation Laboratories

Post 683

Duties include computer operating, digitising and data preparation in the department's computation laboratories. The successful applicant will provide technical services for a variety of computer applications in Geographical Science courses. Applicants should have experience of operating a mini computer and have eyesight suitable for digitising work from graphic and stereoscopic images. A particular interest in computer graphics/computer mapping applications and/or familiarity with BASIC or FORTRAN languages would be an advantage.

Salary Scale: T1 or T2 up to a maximum of £2,853 + £470.25 supplement per annum.

COMPUTING CENTRE

Applications Programmer

Post 561 (B)

A new ICL 2980 has been installed running under the VME/B operating system providing a computing service to the whole Polytechnic. Applications programming projects cover all aspects of the Polytechnic's work, including not only scientific and technical work but also the design and implementation of computer systems for the administration and library.

The Computing Centre seeks to recruit a programmer of graduate or equivalent qualifications, and some previous experience, who wishes to increase his/her experience by working on a large modern computer. There is a wide range of projects now being started, including graphics software. Implementation of the IOMS database, and software to support minicomputers linked to the 2960.

Salary scale: AP2/4. Up to a maximum of £3,702 + £502 supplement per annum.

Application forms are available from the Staff Office, Portsmouth Polytechnic, Alexandra House, Museum Road, Portsmouth, or by telephoning Portsmouth 27681, extension 317.

SOFTWARE ENGINEERS

COMPUTER AIDED DESIGN AND DRAUGHTING £6-9K

Computervision a world leader in the manufacture and marketing of CAD systems, requires additional software engineers to join its expanding European development and support teams.

These posts will be based in Computervision's European Software Centre near Amersham and will involve occasional travel to other European Countries.

Applicants should have several years' experience of Fortranprogrammingand preferably someknowledge of mini-computer operating systems and assembler languages. Experience in one or more of the following fields would be an advantage.

1. PC/ES design and production
2. Numeral control applications
3. Cartography
4. Communications

For application form, write or phone to:

COMPUTERVISION LIMITED
Computervision House
Penn Street Village,
Nr Amersham
BUCKS.
Holmer Green (04947) 4771

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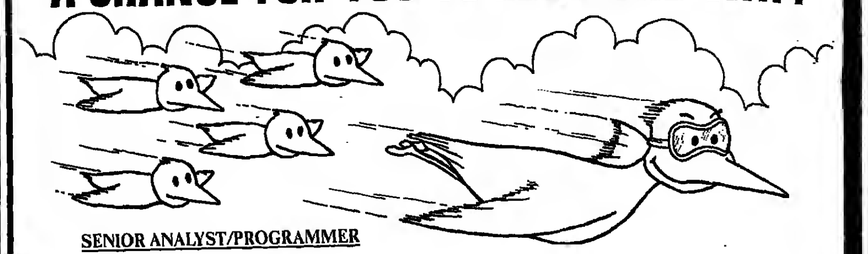

SENIOR ANALYST/PROGRAMMER

(TEAM LEADER)

BERKS/BUCKS BORDER — To £6500

We are seeking a SENIOR PROGRAMMER or ANALYST/PROGRAMMER keen to enhance their career by becoming further involved in Systems Analysis and Design.

The position offers:-

* Team Leading responsibility
* Systems Design and Development Involvement
* Training in IMS and TP Software Applications
* The Opportunity to Gain On-Line Real-Time Experience

Suitable applicants will have at least three years commercial data processing experience with an in depth knowledge of COBOL. The Company offers RELOCATION ASSISTANCE, FIVE WEEKS HOLIDAY and an excellent starting salary.

MYRIAD APPOINTMENTS LTD

Please telephone for a confidential discussion or write to: 30 Fleet Street London EC4Y 1AA 01-353 0981

Home Office
Central Research Establishment
Aldermaston

COMPUTER SCIENTIST

This post with the Information Division of the Central Research Establishment provides an opportunity to join a team of scientists and other operators assisting in the collation and distribution of research information to forensic science laboratories throughout the country.

The successful candidate will be involved in the day-to-day maintenance and operation of a 16K Hewlett Packard 2100A computer, associated terminals and, later, a new computer (planned to come into operation next year) with VDU terminals and on-line links to the forensic science laboratories. Members of the section are encouraged to develop their own ideas for applications into fully operational systems.

Candidates, normally aged under 30, should have a degree/HND/HNC in an appropriate discipline, a knowledge of small computer systems and experience of programming in FORTRAN.

Appointment as Higher Scientific Officer (£4100-£5450) or Scientific Officer (£2840-£4410) according to qualifications and experience. Promotion prospects. Non-contributory pension scheme.

For further details an application form (to be returned by 7 July 1978) write to Civil Service Commission, Alencon Link, Basingstoke, Hants, RG21 1JB, or telephone Basingstoke (0256) 58551 (answering service operates outside office hours). Please quote ref: SS/19/LA.

Science Group CIVIL SERVICE

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We are looking for the following experienced technical support people

HARDWARE preferably with big disc knowledge.
SOFTWARE with assembler and operating systems experience.

Why change to Data General

You'll receive a competitive salary that *really* matches your experience. Naturally, you'll receive standard benefits including a company car/car allowance and be eligible for an excellent pension scheme.

You'll be based in West London, but have the opportunity to travel to Europe on special assignments.

Don't miss this opportunity

Opportunities as good as this don't happen every day of the week. So don't miss out. Write or phone Janet Field at the address below — reversing the charges if you wish.

Data General

Data General Limited, Westway House, 320 Ruislip Road East, Greenford, Middlesex UB6 9BH. Tel: 01-578 9231.

Shift Leader

LONDON N.14

ICL 1903T 9K 6MT 4EDS60

Johnson, Matthey and Co. Limited, leading refiners and fabricators of precious metals, are seeking experienced Shift Leaders for their modern Data Processing Department.

Knowledge of George 2+ and RJE is essential and candidates would be expected to organise and lead a two-shift system (7am-3pm, 3pm-11pm), Monday to Friday.

Commencing salary would be negotiable from £4,000 per annum inclusive and our excellent fringe benefits include free lunches, four weeks holiday and a contributory pension scheme.

Applicants are invited to attend for interview on Monday evening, 19th June between 7 pm and 9pm or apply direct to: Miss B. M. S. Gray, Staff Officer.

JMX JOHNSON MATTHEY
100 HIGH STREET • SOUTHGATE
LONDON N14 6ET • 01-882 8111

Technical Author

IBM United Kingdom Laboratories Limited are looking for a Technical Author, male or female, to join its Technical Documentation department. The work involves the preparation of user and maintenance manuals for the range of program products under development in our Laboratories at Hursley Park, near Winchester, Hants.

You will probably be either: an experienced technical author who has worked on complex programming systems or a data processing professional with an aptitude for communicating in writing.

You must have the ability to negotiate with people at all levels and preferably have a degree in Information Science or a similar qualification.

An attractive salary will be negotiated in line with experience and potential. As well as a substantial employee benefits package which includes a non-contributory pension scheme and free life assurance, we offer generous assistance with relocation expenses where appropriate and variable working hours.

If you are interested, please write giving details of education and previous experience, to Mike Shute, Personnel Officer, IBM United Kingdom Laboratories Limited, Hursley Park, Winchester, Hants., quoting ref.

IBM

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consultants and programmers - Manchester

consultants	to	**£9,000**	**senior programmers**	to	**£6,000**
project consultants	to	**£7,000**	**programmers**	to	**£5,000**

Hoskyns Northern Division has been in operation now for three years. In that time we have trebled in size and can point to an outstanding record of success in a wide range of projects on a wide range of hardware. In the coming year we plan to implement a further expansion programme to build on this success. To support ourexpansion we need further professional staff with practical experience of designing, writing and implementing commercial on-line systems, both on mainframe and mini-computers.

Opportunities exist at all levels for:

Consultants: to evaluate requirements and advise clients on computer strategy; to manage projects from design to implementation. Specific experience of manufacturing industry would be useful.

Project Consultants: to be responsible for the design of advanced systems and to manage programming teams writing those systems. Specific DBMS and TP Monitor experience is required.

Senior Programmers: with some supervisory experience and in-depth programming experience of on-line systems.

Programmers: with at least one year's experience of a commercial programming language.

As one of the largest computer services companies in the country Hoskyns offers a wide choice of career opportunities and locations – we have offices in most parts of the UK and our International Division has worked in most of the European, Middle Eastern, and Commonwealth countries.

Conditions of service are commensurate with what you would expect from a major company in this field – relocation expenses would be paid where appropriate. Although our current offices are in the centre of Manchester we expect to move to Sale in the near future as part of our expansion plan.

If you would be interested in discussing the opportunities with us we would like to hear from you. Write with full career and salary details to:

J. M. Burns
John Hoskyns and Company Limited, Byrom House, Quay Street, Manchester M3 3JD

or telephone: 061-834 4235.

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An unusually interesting position for a person with an analytical background

INTERNATIONAL OPERATIONS PLANNING

Salary: Circa £5,600 plus mortgage subsidy

Home base: Very attractive part of Southern England

Our client is establishing a number of international computer sites. They now want to meet someone who can help plan the local computer environment for these sites. By this we mean the physical environment of the computer room, the staffing requirements and also the implication of future business expansion on these two aspects.

The selected applicant must be capable of assisting local staff at the international sites and advising their management. Therefore, a preparedness to get on with people of diverse nationalities is very important. We are looking for someone who will have the ability to "think in the right way", by this we mean analytically, and who will have probably worked in a problem solving environment for at least two years.

The position will require some overseas travel, occasionally at short notice, and when away from the home base, the applicant will be expected to make decisions without reference to a superior. Therefore, you must have the confidence to be able to do this.

The equipment being installed is in the Burroughs B.1700/1800 range, and some knowledge of this equipment would be advantageous. However, this is not the most important aspect, more important is a genuine enthusiasm, flexibility and an ability to persuade people to do things quickly and accurately.

If the position interests you then we would like to meet you as soon as possible.

Please apply to John Goldsmith, Ref. 1648/CW.

Computing Services Association

WE ARE ALWAYS INTERESTED IN HELPING YOU WITH YOUR CAREER
John Goldsmith (Computer Recruitment) Ltd., 16, Buckingham Palace Road, London, S.W.1.
Tel: 01-828 5356 - 24 hour answerphone service.

JOHN GOLDSMITH (Computer Recruitment) Ltd.

مكتبا من الأصل

Senior Systems Programmer

C.LONDON **£6,500 + Benefits**

Our client, a large service organisation, is seeking a Senior Systems Programmer to assist with the generation and maintenance of the operating system, liaise with the manufacturer, advise and assist users, write and document software interfaces, provide support for computer operations and generally assist the Systems Programming Manager. An IBM 370/158 is in use.

Applicants with at least 2 years experience of IBM ASSEMBLER should be familiar with OS/VS 2, Release 1 or Release 2. Supervisory experience and some knowledge of TP, HASP, Data Base Management Systems, SYSGEN work or VSPC would be an advantage.

If you have the necessary qualifications and would like to be considered for this position, please call in or phone for an Application Form. **Ames Personnel, Suite 14, Dryden Chambers, 119 Oxford Street, London W1R 1PA.**

AMES PERSONNEL 01-434 1106

Software salesmen + Technical support staff

Due to our continued expansion in the fastest growing area in DP, we need a further SOFTWARE SALESMAN to cover the south of England.

The successful applicant will know the IBM 360/370 market place, and will have initiative in an area that will provide good rewards.

In addition **UCC** is looking for TECHNICAL SUPPORT staff to support our customers and marketing staff in maintaining some of the world's leading operating software products. These include UCC ONE (Tape Management Software) and UCC TWO (DOS under OS), which have consistently been voted into the Datapro Roll of Honour. Experience required from our technical staff is a good knowledge of Assembler and preferably experience as a systems programmer.

These vacancies are based in the Norbury office, and if you are interested please write or phone **David McBreen.**

UCC
UNIVERSITY COMPUTING COMPANY
Software Products International

University Computing Company (Great Britain) Limited
125B London Road, Norbury London SW16 4XN. Tel: 01-679 1766.

Norfolk

Chief Programmer

c. £6000

We are a privately-owned, leading provincial newspaper group. Our modern head office is situated in the heart of Norwich, an exceptionally pleasant forward looking City, close to the Norfolk Broads and within 30 minutes of a variety of resorts with golden beaches.

We currently use twin UNIVAC 9480's with communications equipment to support our real time advertising, accounts and text processing systems.

The chief programmer we are seeking will be an experienced UNIVAC/IBM BAL programmer, capable of motivating, directing and providing technical expertise for a small team of programmers.

The successful applicant will participate in profit sharing, pension and life assurance schemes, canteen and social club facilities and will have the opportunity to influence the Company's view on future computer usage. Assistance is given with relocation expenses where applicable.

Application should be made in writing to
Personnel Officer
Eastern Counties Newspapers Ltd
Prospect House, Rouen Road
Norwich, NR1 1RE
Telephone 0603 28311

IRANIAN NATIONAL BLOOD TRANSFUSION SERVICE TEHRAN

سازمان انتقال خون ایران

PROJECT LEADER

(approx. £19,000 p.a. + termination bonus and car)

for implementation of mini-based **interactive computer systems** to support the operational functions, planning/budgeting tasks and routine administration of the Iranian National Blood Transfusion Service.

He/she will be expected to make a working contribution to the detailed design, development and implementation of the systems, to participate in the selection of project staff (expatriate and Iranian) and to play an active part in the on-the-job training of Iranian project staff. He/she will have to co-operate closely with the medical and management staff of the INBTS who are actively involved in the planning for systems automation.

Applicants should have a relevant university degree and **at least ten years** practical experience of systems design/implementation and programming (in more than one language, including **Assembler** or equivalent), using several different makes of hardware on a variety of applications. They should have managed projects and project teams successfully; in recent years they should have worked on the design and implementation of mini-based interactive system(s) in a senior capacity.

The Project Leader who will report to the Deputy Director of the INBTS, will be appointed for a minimum of 18 months at a salary of 2,500,000 Rials p.a. (which includes a housing allowance). Additional benefits include: termination bonus, car provided, 5 weeks paid leave p.a. and generous relocation allowance.

Initial interviews will be held in London during the first half of July; shortlisted candidates will be asked to attend final interviews in Paris between 23rd-29th July.

Applications, with curricula vitae, should be addressed to Box No. 1957, Computer Weekly, Dorset House, Stamford St., LONDON SE1 9LU.

MYRIAD APPOINTMENTS LIMITED
Computer Personnel Consultants

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Our Client is seeking an experienced D.P. professional who has the ability to manage, motivate and train staff under their direction.

The installation houses a Honeywell 2050 operating under OS 2000 with Redifon key to disc equipment currently being used for data preparation. Plans to upgrade the hardware and develop on line applications are well advanced.

Suitable candidates will have a programming background with knowledge of COBOL and Easycoder. Ideally applicants will have worked to good standards and will be keen to train and motivate junior staff.

In addition to a competitive salary the Company has a pleasant working environment and good conditions of employment. Assistance with relocation expenses will be available where necessary.

Ref. W1/0806

24-hr. answering service
Please telephone for a confidential discussion or write to:
30 Fleet Street London EC4Y 1AA
01-353 0981

PROGRAMMERS

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Come and help us meet the business needs of the next decade.

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Bring your enthusiasm and a minimum of 18 months' experience to bear on our problems of developing existing systems. These already use a network of 380 V.D.U.'s and remote printing.

On line development of programs through MAC terminals.

Logical Data Analysis techniques are now being used to determine the form of our data base(s).

The starting salary will be in the range £2888 to £3818 p.a. according to experience.

* This figure includes Phases I & II Pay Policy Supplements which are payable in addition to the salary range quoted. (Phase III is currently being negotiated). There are also other benefits usually associated with a large, progressive industry.

For further details, please ring Peter Garrett on 021-705 6888, extn. 8285, or apply in writing to —
Senior Personnel Officer, (HQ & Marketing),
West Midlands Gas, Wharf Lane, Solihull,
West Midlands B91 2JP.

WEST MIDLANDS GAS

PES
9-11 Tatton Street, Knutsford WA16 6AB Cheshire Tel: 0565 4725

Nationwide Computer Recruitment Consultants

The positions registered with us currently are simply too numerous to mention in any detail here. Suffice to say that if you're contemplating a move, we'll take the load off your shoulders by doing the necessary. So, whatever your role in DP, whether you're a high flying salesman or a more modest Cobol programmer with a year's experience and live or wish to move to anywhere in the United Kingdom, phone us today and we'll get cracking on your behalf.

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Peter Smith (Altrincham). Bill Baker (Sheffield)

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Altrincham – Ashley House, Ashley Road, Altrincham, WA14 2DB. Tel: 061-928 8302 (Peter Smith). Sheffield – Bank House, Queen Street, Sheffield, S1 1UF. Tel: 0742 738794 (Bill Baker).

STRATHCLYDE REGIONAL COUNCIL

GLASGOW SUB-REGION

COMPUTER (HEADQUARTERS) DEPARTMENT

PROJECT LEADER

May House, Anderston Cross, Glasgow

Salary Scale - SO2 - £5583 £6063 plus supplement of £520 per annum

The successful applicant will be responsible for a small team of FORTRAN Analyst/Programmers providing a service to Technical Departments in the use of Engineering, Scientific and Statistical packages utilising in house time sharing facilities. Applicants must have a Science or Engineering degree plus extensive FORTRAN experience and experience in the implementation and use of similar packages.

Application forms may be obtained from The Assistant Director of Manpower Services, 21 Gordon Street, Glasgow G1 3PB, to whom completed forms, quoting Ref. 0351, should be returned by 28th June, 1978.

B. M. H. McCULLOCH
Director of Manpower Services

COMPUTER PROGRAMMERS

£4,500-£5,500

required with Commercial Systems, ASSEMBLER COBOL, experience.

To join small enthusiastic comp. manufacturing company.

Contact Brian Bonfield
Hemel Hempstead
0442 65295

or apply in writing to:

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Marlowes, Hemel Hempstead, Herts.

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Work is interesting and varied. Recent projects include a large database system, unit trust administration, retail sales and stock control, and real-time consumer credit sanctioning. We now need:

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Self motivated, with broad commercial experience and able to control projects. Salary to £6,500 (subject to review). Ref. 1650/1.

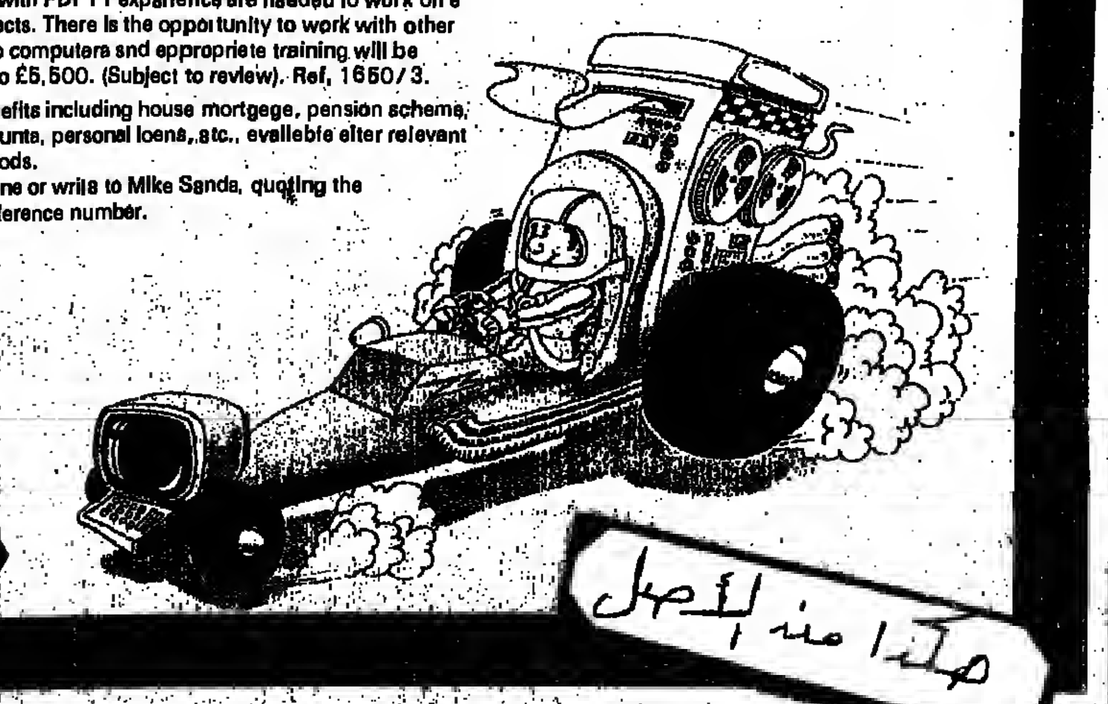
Senior Programmers

At least four years' experience with IBM 370 and COBOL knowledge. Structured programming and database techniques are used and if necessary training will be given in these. Salary to £5,500. (Subject to review). Ref. 1650/2.

Mini-Computer Programmers

Programmers with PDP11 experience are needed to work on a variety of projects. There is the opportunity to work with other mini and micro computers and appropriate training will be given. Salary to £5,500. (Subject to review). Ref. 1650/3.

A range of benefits including house mortgage, pension scheme, free bank accounts, personal loans, etc., available after relevant qualifying periods.
Please telephone or write to Mike Sands, quoting the appropriate reference number.



Centre file

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John Goldsmith (Computer Recruitment) Ltd.,15,Buckingham Palace Road, London, S.W.1.
Tel: 01-828 5356–24 hour answerphone service.

Computing Services Association

JOHN GOLDSMITH (Computer Recruitment) Ltd.

University of Birmingham

COMPUTER CENTRE

Adviser for Interactive Computing

The Centre's provision of a wide range of local and remote computing facilities is now being extended by the installation of a large, dedicated interactive system for both teaching and research.

A new post of Computer Officer, tenable for two years from 1st October, 1978, has been created in the User Services Group to develop the use within the University of:

Computer Aided Instruction and
Computer Aided Learning techniques.

Applications are invited from graduates with computing experience, especially in the areas of simulation and modelling techniques. A higher degree is desirable, but clear evidence of previous work successfully completed is equally important.

Starting salary, according to age, qualifications and experience, will be on the scale:

£3,169-£5,262-£6,178 (under review).

Further information from the Assistant Registrar, Science and Engineering, University of Birmingham, P.O. Box 363, Birmingham B15 2TT, to whom applications (three copies) including full curriculum vitae and naming three referees, should be sent by 3rd July, 1978.
Please quote ref. CWZ4.

THE OPEN UNIVERSITY
Student Computing Service

ASSISTANT AREA COMPUTING SERVICE MANAGER

Applications are invited for the above post, at the university headquarters at Walton Hall, Milton Keynes. The Student Computing Service maintains a large national time-sharing network using DEC-20 and Hewlett Packard 2000 computer systems which provide a practical computing service to 30,000 students via remote terminals. Most of the systems and programming development work associated with student material is carried out at Walton.

The successful applicant will have a good background in computing, probably with experience in Operations and Programming, and preferably including some contact with time-sharing communications equipment, staff management, development of procedures and liaison with users and engineers.

He/she will be responsible for the day to day operation of the installation and will assist the Area Manager in the provision and maintenance of a network of remote student terminals.

Salary, according to experience, will be within the range £3189-£8178 p.a. The University offers a holiday allowance of 30 days plus closure days at Christmas and Easter. Excellent Superannuation benefits are available and a relocation grant may be made towards the cost of removal due to take up the appointment.

Application forms and further particulars are available, by postcard request please, from The Recruitment Officer (ACSM1), The Open University, P.O. Box 75, Walton Hall, Milton Keynes, MK7 6AL, or by telephone from Milton Keynes 63404, or Milton Keynes 63868 (24 hour answering service).

Closing date for applications 30th June, 1978.

Distributed Processing and Scientific Systems

Junior Systems Analysts

(Ref. F379)
£4569-£4999 p.a.

Programmers (Ref. F129)

£4218-£4518 p.a. or £3802-£4073 p.a. (Salaries to be reviewed July 1st)

The Authority operates an ICL 2900 series computer and a network of 2903s in divisional centres. It is now proposed to extend this network by installing mini-computers in 20 or more laboratories to capture and process scientific data. The laboratories will be linked to the divisional centres which in turn are linked to the central machine based in Birmingham. The data captured in the laboratories will be progressively refined as it proceeds to the centre of the network.

The present requirement is for energetic and intelligent persons (male or female) to join the development team engaged on this project, and preference is likely to be given to those with a scientific and/or mini computer background.

In addition to this major project there are also vacancies in the Authority's engineering computing support team and applicants, if willing, will also be considered for placement in that area.

Further details and application forms are obtainable from the Regional Personnel Manager, Severn Trent Water Authority, Abelson House, 2297 Coventry Road, Sheldon, Birmingham B26 3PU. Telephone: 021-743 4222 Ext. 76 or 77.

SEVERN TRENT WATER

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Product Management in Control Dataset Ltd.

Control Dataset is a joint venture between Control Data Limited and International Computers Limited. It is the United Kingdom's largest computer supplies company; manufacturing and marketing paper products, ribbons, furniture and magnetic media to a wide variety of computer users. Annual turnover is in eight figures.

In order to support its position as market leader the Company is currently seeking men or women to fill two vacant positions in its Product Management team.

PRODUCT MANAGER

An experienced Product Manager is required for this position which carries responsibility for the Company's major product lines (Magnetic tape and discs). Essential background must include at least four years in marketing consumer good, education to degree level and preferably an understanding of the computer industry. Starting salary will be attractive and there is a bonus payable against defined objectives. A company car is provided.

ASSISTANT PRODUCT MANAGER

For this position we are seeking a candidate who has substantial theoretical training (perhaps through studies for an MBA or degree in Business Studies with a marketing emphasis allied to practical experience) in systems analysis or computer support activities. The successful candidate will be responsible for a defined sector of our product range, initially under close supervision, and will receive necessary additional training. There is a clear opportunity for personal development in this marketing-orientated organisation. Starting salary for the position will be according to qualifications and experience.

Both these posts are based in Letchworth (relocation to Stevenage early in 1979), and relocation assistance will be provided where appropriate. Other benefits are those you would expect of a major employer in the computer industry.

Please write, giving brief personal career details, to:

Mr. D. Firth-Clark,
Personnel Manager
Control Dataset Limited
Arena House, Broadway
Letchworth, Herts SG6 3BX

CONTROL DATA

QUEEN ELIZABETH MEDICAL CENTRE BIRMINGHAM

SOFTWARE PROGRAMMERS

FOR REAL-TIME PROJECT
Salary c. £4,400

We are looking for programmers with more than 1 year's software experience to join our Software development team. We use Univac hardware with in-house transaction and database software for our Real-time Patient Care System.

Pleasant working conditions and flexitime scheme.

For further information and application form write or phone: Mr. D. Winkley, Programming Manager, or Mrs. J. Thorpe, Administrator Computer Services Unit, Queen Elizabeth Hospital, Edgbaston, Birmingham B15 2TH. 021-472 1377 ext. 250.

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MANCHESTER BASED (HEADQUARTERS IN BOSTON USA)

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Applicon is a world leader in Computer Graphics, one of the most exciting and fastest growing areas in today's electronics industry. They supply the most advanced and cost effective graphic systems available and users include many of the world's leading companies.

In the UK Applicon's potential is impressive and this has led to the recruitment for 2 Systems Engineers of the highest quality. One with STRONG ELECTRONICS EXPERIENCE IN PCB DESIGN and the second with a CAD/CAM/3D ORIENTATION.

QUALIFICATIONS:

1. Strong personal motivation and enthusiasm, and communication skills.
2. PCB candidates will have quality experience in this field and a high standard of academic attainment.
3. Candidates for the CAD/CAM/3D position will be experienced in this field, may well be Ph.Ds and have a background including NC and FINITE ELEMENT ANALYSIS.
4. For both positions mini computer and Fortran experience is important.

Please send your career details direct to DPSC Group, alternatively telephone for a confidential discussion.

DPSC GROUP LIMITED, CROWN HOUSE, MORDEN, SURREY SM4 5EU. Tel: No: 01-540 8311.

Ref: CW 929

DP SC

PROGRAMMER/ANALYSTS

ARE YOU INTERESTED IN FUTURE CAREER DEVELOPMENT?

IF YOU ARE CAPABLE OF EARNING **£5,000 to £6,000** PER YEAR AND HAVE

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COULD YOU WORK IN A SMALL ESTABLISHED TEAM? WITH THE

ABILITY TO WORK ON YOUR OWN INITIATIVE?

LOOK, IF THE ANSWERS TO THESE QUESTIONS IS YES THEN

LET US KNOW, GIVE US A RING

We are a major International company providing Car Phone, Pocket Bleeper and Medical Deputising services throughout the UK and overseas.

Our present 2903 with EDS30s will shortly be enhanced to 40K 2904 with 600 lpm printer and VDUs. Future plans include an independent computer division.

This is an ideal opportunity for career development and to make a positive contribution to the ambitious plans of this go-ahead company. Benefits include bonus scheme, 4 weeks' holiday, pension scheme and further training into online database and new languages.

Please phone:
Tim Cullis
Systems & Programming Manager
Air Call Ltd.
Phone 01-834 8824, ext. 1980
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communications services

Real Time Systems & Software Designers

to meet the needs of the 1980's in computer-controlled communications

At Beeston, Nottingham, Plessey is building a team to design a new range of processor controlled switching and office automation systems offering a wide range of fascinating applications. The Company has a notable export record and aims to increase its influence in world telecommunications markets.

Real Time Systems and Software Designers are needed to come into this growth activity and to enjoy the scope for career progress and job satisfaction. You would be actively involved in contributing to system philosophy and would undertake the design and implementation of digital systems.

Candidates should have experience of real time programming and design or micro-computer hardware experience.

Salaries, up to £6,500, will be negotiated in line with experience and qualifications. The Company will assist with relocation costs and may be able to help in obtaining a mortgage in this low cost housing area. Applications are invited from men and women.

PER
Professional & Executive Recruitment

Please ring or write for details:
David Harris, PER, Lambert House East, Clarendon Street, Nottingham.
Tel: Nottingham (0602) 49781.

PLESSEY

COMPUTER MAINTENANCE ENGINEER

The Central Electricity Generating Board is looking for a suitable person to join the staff at HEYSHAM POWER STATION which is under construction to the south of Morecambe Bay, Lancashire.

A computer maintenance engineer is required for the power station control equipment. This equipment comprises 3 Ferranti Argus 500 computers on process control, data, alarm analysis and recording, and 2 off-line PDP 11's based data processors.

This post is for a day work engineer to provide back-up service to a team of shift engineers on this equipment.

Applicants should possess suitable qualifications and must have sound experience of digital computer based control systems. The ability to read simple diagnostic maintenance programmes will be necessary although training can be provided.

Salary will be within one of the following ranges depending on qualifications and experience: £5495-£7221 p.a. or £4181-£5175 p.a.

Applications in writing, from either sex, giving details of age, experience, qualifications, etc. to the Personnel Manager, C.E.G.B., Europa House, Bird Hall Lane, Cheadle Heath, Stockport, Cheshire SK3 0XA to arrive no later than 3 July, 1978. Please quote vacancy number 514/CW.

SENIOR PROGRAMMER

(Ref. M.18) **Salary up to £5,500**

If you are an experienced programmer ready to take responsibility for others why not come and join us at Lambeth?

In addition to managing a team of programmers you will also assist in the design of systems and the preparation of program specifications. Computing at Lambeth is currently based on twin ICL 1900's supporting a variety of batch and on-line systems.

The computer centre is located close to tube and main-line stations as well as major bus routes. Other benefits include flexitime, subsidised canteen, generous holidays and assistance with relocation expenses in some cases.

Further information or application form obtainable from the Personnel Officer, Directorate of Management Services, London Borough of Lambeth, Hambrook House, Brixton, S.W.2, or telephone 01-274 7722, Ext. 696.

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ARRAY PROCESSOR

SALES EXECUTIVES £15,000

FLOATING POINT SYSTEMS Array Processors are attached to minicomputers and large mainframes to provide higher speed computerisation and greater accuracy. This cost effective solution to large scale scientific problems has lead to rapidly expanding sales in an exciting range of prestigious applications.

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WE REQUIRE
- Proven record of computer sales
- Experience of Scientific Markets
- Programming knowledge (at least FORTRAN).

WE OFFER
- An outstanding career
- A high base salary plus commission and car.
- Located at Reading
- Sales in UK, Holland and Scandinavia

SUPPORT ANALYSTS

— are needed to complement our highly professional team. This will involve both pre and post sales effort and will require understanding of problems within all our application areas. Experience of matrix computing methods and signal processing will be an advantage.

Please write in confidence to:
Steve Markham
Floating Point Systems S.A. Ltd.,
42 Queens Road, Reading, Berks.
(0734) 50181

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This position will be of particular interest to a dynamic young man or woman with a flair for Sales and Administration in a very fast moving environment.

The person appointed will work directly with our clients and co-ordinate all advertising and recruitment drives.

Salary and conditions will be commensurate with the importance we attach to this position.

Please apply in writing with full Curriculum Vitae to

Mr. G. W. Ludbrook
Ludbrook Management Services,
1 Gallowtree Gate,
Leicester.
Telephone Leicester (0533) 52318

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A NEW ENVIRONMENT

NORTH LONDON to £3900

A leading manufacturer of equipment for the Print industry winning several Queen's Awards for the Industry (in the export market), now requires OPERATORS to join their friendly team running a Century 75. There will be a complete CHANGE OF MAINFRAME to a SYS. 3 MOD. 15D in the Summer, coupled with a move to a NEW COMPUTER SUITE and the introduction of a TP NETWORK.

It is envisaged that the successful applicants will have 6-18 months' experience on NCR equipment and can show the initiative and responsibility to become an integral part of the organisation.

The installation is easily accessible by public transport and a holiday bonus is paid. Ref. RJ. 237.

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Your experience pays off in the Computer industry

DataGeneral is the world's third largest producer of small computers with more than 50,000 installations in 53 countries.

We would like to hear from Electronic Engineers/Technicians with ONC, C&G qualifications, or relevant Forces experience. Depending on your experience, you can expect to be offered a starting salary of about £4,000, a company car and, if based in London, a weighting allowance of £500 p.a. You will be offered a career with potential for much higher earnings as your computer servicing experience develops. Our fully trained Engineers can earn £6,500 inc. overtime, on-call etc. Don't miss this chance to get into the highly lucrative computer industry.

Experienced Computer Service Engineers

We also have a few vacancies for experienced computer Service Engineers in Birmingham, Glasgow, Manchester, London and the Home Counties. For all the above vacancies please write or phone Janet Field at the address below — reversing the charges if you wish.

Data General

Data General Limited, Westway House, 320 Ruislip Road East, Greenford, Middlesex UB6 9BH. Tel: 01-578 9231.

Computer Programmer

Golden Wonder Limited, a member of the Imperial Foods Group, are now seeking a Computer Programmer to fill a vacancy created by internal promotion.

The present configuration is an ICL 64K 1902T with discs, tapes and V.D.U's. This will shortly be upgraded to 96K with 7502 systems supporting further V.D.U's. Applicants should have COBOL programming experience.

We also make extensive use of the FILETAB language and develop on-line systems using applications manager software. The successful applicant will play an active role in our development programme using all three of these languages. Training will be given where necessary.

Our salaries are competitive and we offer 22 days annual holiday plus 8 statutory days, and a subsidised dining room in our modern offices situated in the centre of Market Harborough.

Please telephone Market Harborough 4771 or write for an application form to:
Mrs. J. M. Freer, Employment Officer,
Golden Wonder Limited,
Edinburgh House, Abbey Street, Market Harborough, Leicestershire.

Golden Wonder

CP

LEEDS

PROJECT LEADERS
£4,500-£6,000 + Profit Share

Three years' commercial experience with a sound background of ASSEMBLER and high level languages. To be involved in full development from Systems Analysis through programming to implementation.

PROGRAMMERS
£3,500-£5,000 + Profit Share

COBOL experience and ASSEMBLER an advantage. Software house environment. Rapid progression to Project Leader level expected.

SYSTEMS ANALYST
£5,500

Level 66/20. Batch/On-line. Must have 3/4 years' experience. Excellent prospects in fast moving bureau environment. Bureau experience desirable but not essential.

PROGRAMMERS
£5,000

ASSEMBLER preferably on mini but IBM considered. Excellent opportunities to expand with a fast growing software house. Must have a commercial applications background.

73/75 ALBION STREET
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SYSTEMS CONSULTANT
£7,500 + car

To assist in the implementation of all manufacturing systems for a number of medium sized engineering companies. Must have good production control experience.

COBOL LECTURER
£4,000-£6,000

Major training Company requires well experienced COBOL programmer. Preferably on IBM and/or ICL kit. Must be able to communicate effectively. Good prospects.

PROGRAMMER
£3,500-£6,000

Experienced IBM COBOL programmer for work on a variety of installations in the North West. General commercial experience required. Must be mobile.

SYSTEMS PROGRAMMER
£4,900

Working on ICL 1900, but shortly introducing ICL 2900. Must have COBOL experience. Knowledge of stock and production control an advantage.

65 PRINCESS STREET
061-236 4593

SHEFFIELD

ANALYST/ PROGRAMMER
£5,300

With two years' scientific applications on minis. ASSEMBLER, FORTRAN, CORAL, RTL 2, for manufacturing environment. Small departments. Excellent promotion prospects. Relocation.

PROGRAMMER
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COBOL programmer. 1½/2 years' experience commercial applications on 1900 series being upgraded Bureau environment. On line. Excellent prospects.

ANALYST/ PROGRAMMER
£5,400

COBOL ICL series. Database environment. Two years' commercial experience. User liaison. On-line/batch installation. Excellent prospects in forward looking company.

PROJECT LEADER
£6,500 + Review July

With at least five years' experience in O.P. coming through programming and Systems Analyst rank. Self-motivation and staff control a must. Able to converse at all levels. A demanding position in a forward looking Bureau environment.

54/56 FARGATE
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IF THE JOB YOU REQUIRE IS NOT HERE — PLEASE RING OR CALL IN AT ANY OF THE ABOVE BRANCHES — WE ARE HERE TO HELP YOU IN 1978.

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SYSTEMS DESIGNER/ PROJECT LEADER

BRISTOL — **T/P RESERVATION SYSTEM** — **CIRCA £7,000**

THE COMPANY: PSL is a systems house with an enviable record of growth. We supply turnkey computer systems throughout the U.K. and Europe, currently concentrating on Honeywell Level 6 mini-computers.

THE POSITION: PSL now needs a highly talented systems designer to form the nucleus of its Transaction Processing Systems group, based in Bristol. Experience of commercial on-line systems using high level languages is essential. Initially he or she will play a key role in the development and implementation of a highly interesting reservation system.

THE FUTURE: The person appointed must have the ability to motivate and manage a team of up to seven Analysts/Programmers, and with the continued expansion of the Company, promotion prospects to more senior positions are excellent.

In the first instance please contact ANDREW SANSOM on 01-878 7861.

PSL 328 Upper Richmond Road West London SW14

Telephone 01-878 7881

DOUGLAS

SYSTEMS ANALYSTS PROGRAMMERS

The Douglas Group comprises of a number of Companies within the Construction Industry at home and abroad. A powerful replacement computer will be installed in 1979 to handle several new terminal systems for which experienced Systems Analysts are now sought.

PROGRAMMERS with at least three years' experience may move into Systems Analysis after a short qualifying period. There are some vacancies to suit applicants who may wish to make this transition.

Both positions will appeal to applicants who wish to develop their careers using the latest techniques.

Send details of career to: Mr. J. S. Aitken, Data Processing, Manager, R. M. Douglas Construction Ltd., 325 George Road, Erdington, Birmingham B23 7HZ. Telephone 021-366 4886 Ext. 201.

Inner London Education Authority

ILEA Schools and College Computer Service Supervisor

Salary range: £4442-£5058 inclusive of £606.50 of London Weighting and Phase I and II supplements)

This post is seconded by the ILEA to the City of London Polytechnic Computer Centre. The person appointed will work to the computer manager and will be responsible for the day-to-day supervision of a computer service to 160 secondary schools and some 30 colleges of further education. Interactive facilities are provided on a HP2000 and a Systime 5000 which will shortly be enhanced to support jointly, up to 80 simultaneous users. There is also a van courier service for batch processing. There is a team of support staff working to the supervisor.

The Authority is committed to developing computer education in it schools and colleges and the person appointed will have an interest in all aspects of this development.

Application forms and further details from: The Education Officer, EO/Estab 2A/1, Room 387, The County Hall, London, SE1 7PB.

Please enclose a large, stamped addressed envelope for reply.

Completed forms to be returned not later than Friday, July 7, 1978.

"Here Again, Are the Main Points of the News . . ."

A widespread search is still continuing for people to fill the following well-paid opportunities.

Operations	
SYSTEM 3	Greenford
SYSTEM 4	Heyes
PDP11/70	WC1, N1
BURROUGHS	Kew
370	Brentford, Hounslow
1900	Edgwers
Programming	
ASSEMBLER	W1, Camberley, Borehamwood, Burton-on-Trent, Horley, Welton-on-Thames, Romford/Chatham, Whyteleafe, Degenham, Brentwood.
COBOL	E7, SE1, City, Hayes, Morden, Burton-on-Trent, Bracknall, Stevenage, Degenham, Whyteleafe, Edgware, Romford, Harlow, Horley, Greenford, Besildon, Chelmsford, Brentwood, Herrow.
PL1	City, Guildford, Croydon, Hermondsworth, Chatham, Horley, Burton-on-Trent,
RPG11	City, Kingston, Cambridge, Bury St. Edmunds, Colchester, Crawley, Wembley, Greenford.
FORTRAN	City, Horley, Essex.
Analysis	E7, Colnbrook, Greenford, Degenham, Stevenage, Harrow, City, Cambridge, Crewley, Whyteleafe, Richmond, Harlow, Rayleigh.

And there's plenty more where these came from!

Varied Applications — Trainee to Senior.

Sales — Packages, Minis and Mainframes to be sold throughout U.K.

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MARTON associates

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☎ 01-283 3237

Traffic Control
Traffic Engineer/ Technician — P&TOII
£4326-£5739

Applications are invited for the pensionable post of Systems Engineer (Hardware) P&TOII in the Department of the Environment (NI) Urban Traffic Control Team which is presently being planned for Belfast.

Applicants should have held a position of responsibility involved in the production, installation or maintenance of equipment in the field of Data Transmission, Line Communication, Electronics or Computer Hardware. They must also have obtained one of the following qualifications —

(a) a Degree in Civil, Mechanical or Electrical Engineering, plus 2 years' post-qualification experience,
OR
(b) an HNC/HND in Civil, Mechanical or Electrical Engineering or equivalent, plus 7 years' post-qualification experience. Exceptionally candidates with an appropriate ONC/OND and at least 10 years' post-qualification experience may be considered.

The successful applicant will be required to advise on all technical matters associated with the system's hardware and to liaise with staff responsible for the Software and Traffic Engineering.

Starting salary which is on the scale £4326-£5739 will be related to qualifications and experience.

Please write or telephone for an application form, quoting job reference S8 172/78/GW, to the Civil Service Commission, Rosepark House, Upper Newtonards Road, Belfast BT4 3NR (telephone Oundonald 4686 ext. 306). Completed forms must be returned to arrive not later than 29th June, 1978.

NORTHERN IRELAND CIVIL SERVICE

SENIOR ANALYST/ PROGRAMMER

The Company is a leading manufacturer of electrical appliances with 1200 employees and two factory locations. Due to the variations in requirements and wide range of manufacturing processes, control of materials and stocks involves computer systems, which are likely to be further extended to improve production efficiency.

The person appointed will play a key role in maintaining and extending computer systems. He or she will be in charge of an IBM Systems 3 Model 8 computer installation, and will be involved in varied commercial applications and in preparing a new order entry/invoice system and a much more informative payroll. Assisted by two trainees and the punch room staff, the Senior Analyst will be responsible for RPG programming and IPICS for the two factories.

Where necessary, training will supplement experience, and prospects of promotion are good. The salary will be in the range £4000-£5000, according to age and experience.

Benefits of working for the Company include, subsidised restaurant, 4 weeks holidays, pension scheme, woodland location with on-site sports and social facilities and BUPA membership.

Write with full details of experience and salary required, or write/phone for an application form to:

Personnel Manager
Goblin (BVC) Limited
Leatherhead, Surrey
Ashstead 78121

GOBLIN BVC

A member of the BSR Group

IBM 370 APPLICATIONS PROGRAMMERS

We are a leading independent Brewery Company situated in North Cheshire, operating batch processing work on an IBM 370/115 mainframe computer and supporting three IBM 3790 direct order entry systems, for the Greenall Whitley Group.

We require two applications programmers with at least two to three years' programming experience, preferably in PL1, to be involved in developing new systems under the guidance of our senior programmer.

They will also be required to train as support programmers for the group 3790 system and any knowledge of this programming language would be an advantage.

Salary is negotiable and company benefits include a non-contributory pension scheme, a staff bonus scheme, 4 weeks annual holiday and a good working environment in a new computer block.

Application forms may be obtained from:

The Company Secretary
GILBERT & JOHN GREENALL LTD.
P.O. Box 2, Culoneyey Distillery
Warrington, Cheshire
Telephone: Warrington 50111

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occ computer personnel limited

The door to opportunity...

We at OCC have been recruitment consultants to the computer industry at home and abroad for over seven years, and continued growth means we need to recruit two additional consultants. You need self-motivation, the ability to deal convincingly with candidates and clients at all levels, and the ability to express yourself well in speech and writing. Your past experience is less important and could have been in systems support, consultancy or personnel.

Senior Personnel Consultant to £7,000

Personnel Consultant to £5,000

★ Variety of work
★ Personal development
★ Professional environment
★ Excellent conditions

Working as a consultant for OCC offers you a variety of work and exposure to a wide variety of hardware, software and applications. You will meet a lot of people, both as clients and candidates, and you will visit client sites to discuss current requirements. The work provides considerable scope for personal development.

OCC have been at the forefront of developing a set of standards for the recruitment companies through the Computing Services Association. You will therefore join a highly professional team. You will work in a relaxed and friendly environment, although high standards of work are expected. A training programme tailored to your particular needs, will be drawn up when you join. Conditions of employment include pension and sick schemes, regular appraisals and salary reviews, etc.

If you are interested in the opportunities we offer, please contact me, Neville John, to discuss matters further. Day telephone: 01-242 9356. Evenings or weekends Famborough (Kent) 52017. Alternatively, to find out more about us and meet some of our consultants, informally, come to our offices at the times shown opposite.

INFORMAL DISCUSSIONS:

Monday, 17th July
Tuesday, 18th July
Wednesday, 19th July
up to 7 p.m.

Members of Computing Services Association

16 Bedford Row
London WC1R 4EB
01-242 9356
Telex 21120

OCC

Specialists since 1971 in UK and international computer appointments

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SCANDINAVIAN BANK

requires

EXPERIENCED ANALYSTS AND PROGRAMMERS

Due to the continued expansion of the Bank and its OP activities the following additional staff are required.

SYSTEMS ANALYSTS
With at least two years' experience in a banking environment. Experience of on-line systems an added advantage.

COBOL PROGRAMMERS
With two years' programming experience on an IBM 370 under DOS/VS and POWER/VS. Knowledge of Assembler and/or CICS/VS an added advantage.

The Bank is currently developing a sophisticated on-line/real time system and the new entrants will form part of the development team.

Attractive salaries commensurate with experience. Fringe benefits include low interest mortgage scheme, non-contributory pension scheme, luncheon vouchers and season ticket loans.

Apply in writing quoting experience to:

DATA PROCESSING MANAGER, SCANDINAVIAN BANK LIMITED
99 LEADENHALL STREET, LONDON EC3A 1BH
TELEPHONE: 01-709 8565

Computer Programmers

Lucas World Service require programmers, with at least two years COBOL or ASSEMBLER experience, to work in the centre of Birmingham.

The successful applicants would be required to work on Order Processing and ancillary systems currently running in real-time on two UNIVAC 418 111 but to be replaced by a large distributed network in two years. Experience with mini computers would be an advantage but not essential.

Full details of qualifications and experience should be forwarded to:
Personnel Manager,
Lucas Service UK Limited,
Plume Street,
Aston,
Birmingham B6 7RS.

Lucas Service

occ computer personnel limited

Financial Systems

Banking **Clearing Houses**
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International consultancy — Opportunity for overseas travel — Turnkey Mini and Mainframe systems.

Already acknowledged as one of the market leaders in the area of Financial Systems development, our client, a major UK based International Consultancy Group, now wishes to appoint a number of additional personnel for new projects both in the UK and overseas. The Finance Division is primarily concerned with the development and implementation of Business and Financial Systems, many of which involve Real Time, Communications or Network Processing.

Systems Consultants £6,000 - £8,500

Systems Consultants should have at least 4 years' Systems experience, and a knowledge of programming. Specific experience should include some involvement in one of the areas listed above. Candidates should have either Project Leader experience or potential to develop into this role in due course.

Software Consultants £6,000 - £8,500

Software Consultants should have experience of Real Time mini computer software in any application area. The essential requirement is the ability to design/enhance and implement complex systems software.

Programming Consultants £4,500 - £7,000

Programming Consultants should have a minimum of 2 years' programming experience.
Mini experience is of particular interest as is experience of Financial or Accounting systems. For some projects, IBM PL1/CICS would also be useful.

To apply for these positions, or for further information, please contact Roger Allington on 01-242 9356 (day) or Berkhamsted (04427) 2299 (evenings/weekends). Ref: 310F/CW/RA.

16 Bedford Row
London WC1R 4EB
01-242 9356
Telex 21120

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Specialists since 1971 in UK and international computer appointments

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PROGRAMMERS & ANALYST/ PROGRAMMERS who want to move to SYSTEMS/ ANALYSIS

Starting salary up to £5600, around three years main-frame programming experience required. Computer Science graduates would be considered at an appropriately lower salary. (Ref: 660W)

COBOL PROGRAMMERS who want to learn DATABASE & TP TECHNIQUES

Starting salary up to £5600, at least two years programming experience required, including COBOL. (Ref 686W)

PROGRAMMERS who want to move to COBOL

Starting salary up to £5600, at least two years' mainframe experience required (no scientific), any language, any hardware. (Ref: 686WT)

We are recruiting for clients who have a large installation in the West End of London, with plenty of development work, using database and TP techniques. Good training and career prospects, excellent working conditions (new offices).

Please ring us in confidence, quoting the appropriate reference, or leave a message on our answering machine after hours.

Tel: 01-637 6796

EDP Systems
52-53 Margaret Street
London W1N 7FF

COMPUTER OPERATORS & TRAINEES

Cardiff up to £4000

In readiness for our move to 24-hour, 3-shift operating, we need to recruit a number of experienced and trainee operators for our computer centre. The system comprises dual B3501 and B3771 processors with a combined memory of 550 KB and sharing a total disk capacity of 900MB. There will be involvement in a wide range of both routine and special applications including a Real Time Stores System.

Applicants for the posts of operator should ideally have a minimum of 18 months' relevant operating experience on a large commercial installation.

We also have vacancies for Trainee Operators who are at least 18 years of age and will have either limited experience or are interested in starting a career within computing. Salary for this position will be from £2550 depending on previous experience.

Career progression, depending on the individual's ability, is available through Operations Development, Programming and Management.

For further information and an application form please write to: Dave Prestwich, Computer Operations Officer, Wales Gas, Snelling House, Bute Terrace, Cardiff, or ring Cardiff 33131, extension 3276.

WALES GAS
NWY CYMRU

SCIENCE RESEARCH COUNCIL
APPLETON LABORATORY REQUIRES A

SCIENTIFIC OFFICER

To work at the Astrophysics Research Division at Culham on a project to study the X-ray Spectra from Solar Flares. The successful candidate will develop software to run on a PDP11 Computer System for the analysis of data from a satellite that will be launched in October 1979 and should be prepared to spend periods abroad at the Satellite Operations Centre near Washington, D.C., U.S.A.

Applicants for this post should have a degree or equivalent qualification in Physics, Mathematics or Computer Science and some experience of FORTRAN Programming. A knowledge of Mini-Computers would be an additional advantage.

Salary: on the scale £2,839 p.a. to £4,415 p.a., the exact step depending on qualifications and experience.

Non-contributory pension scheme.

Please write for an application form to: The Secretary, Science Research Council, Appleton Laboratory, Ditton Park, Slough, SL3 9JX, or Telephone SLOUGH 44234, Ext. 153.

Closing date: July 5, 1978.

LIVERPOOL POLYTECHNIC
DEPARTMENT OF MATHEMATICS

PRINCIPLE LECTURER COMPUTER SERVICES

Applicants should have a sound knowledge and relevant experience of computer services development and management in the educational context. It is anticipated that this post will eventually be incorporated in a separate Computer Services Unit, the major initial task being to examine needs and make recommendations regarding future provision.

Salary scale. £7047-£8844 p.a.

Application forms and further particulars are available from the Personnel Office, Liverpool Polytechnic, Richmond House, 1 Rumford Place, Liverpool L3 9RH. Tel. 051-227 5881, Ext. 43.

Please quote reference LP/176.

Closing date is fourteen days from the appearance of this advertisement.

UNIVERSITY OF SURREY
COMPUTING UNIT

SYSTEMS PROGRAMMER/ ANALYST

Lively programmer/analyst needed to exercise his/her initiative in a small team involved with the design and improvement of systems using mainframes, minis and microcomputers. Projects may include packet switched networks and multiprocessor and distributor processor configuration. We currently operate two ICL 1900 computers; replacement of the 1900 equipment is expected in the near future.

The salary scale will be up to £6178 per annum with generous annual leave.

Applications giving full details (including the names and addresses of two referees) should be sent to the Assistant Secretary (Personnel), University of Surrey, Guildford, Surrey GU2 5XH, or telephone Guildford 71281, ext. 486 for further information.

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oxford polytechnic

Computer Centre

Chief Programmer

(Salary on PO1 scale up to £[illegible])

An experienced programmer is required to take charge of the Polytechnic team of three programmers. Applicants should hold a degree or equivalent, and have good experience of GEORGE II and MAXIMOP. The Polytechnic has an ICL 1903T which is currently being enhanced.

Further particulars and application forms may be obtained from the Administration, Oxford Polytechnic, Oxford OX3 0BP, to whom they should be returned as soon as possible.

Computer Scientist for Petro-Chemical Research

Due to the increasing number and complexity of projects both in hand and imminent, our Research Centre at Abingdon - which specialises in fuels, lubricants, and additives - needs a technically-minded and creative man or woman to join a small team providing an efficient, and flexible computing service for our scientists and technicians.

Using the Centre's multi-terminal interactive PDP II System linked to the worldwide Exxon IBM 370 network, this team is responsible for all aspects of computer application and development arising from projects under investigation, including the use of mini computers in data logging and real-time applications.

With a degree in Maths, Statistics, Chemistry, Electronics, Chemical Engineering, or an associated discipline, you must be able to appreciate the scientific problems encountered in our research - logically thinking them through to provide cost-effective computer solutions.

At least one or two years' practical experience with systems or software is essential - preferably in a scientific environment. A statistical background would also be an advantage.

A competitive salary will be supplemented by a full range of benefits; and generous relocation assistance to this attractive rural area - just an hour away from London and only 20 minutes from Oxford - will be provided where appropriate.

Please write with full details, to: D P. Sweeney, Employee Relations Service, Esso Research Centre, Abingdon, Oxon OX13 6AE. Or phone him on: 0235 21600.

Esso RESEARCH

Programmers

Opportunities to move into ADVANCED SOFTWARE DEVELOPMENT

A number of opportunities exist to join the young, enthusiastic and professional software development team at Membrain, using advanced structural development techniques to design and implement software which will be the most advanced ATE software in Europe.

The team is now entering an exciting stage in the development of new software for the recently launched MB7700 range of microprocessor controlled ATE including

- ★ High level language compilers
- ★ Automatic program generation
- ★ Advanced fault diagnosis algorithms
- ★ Sophisticated program debug packages

That's just for 1978!

1979 will break further new ground with the introduction of more new products.

Interested? Then read on!

Whilst a knowledge of automatic test equipment would be advantageous, the minimum requirements are education to degree level, preferably in computing science or electronics, and at least one year's experience, ideally in a scientific or technical environment with familiarity with languages such as Algol or Coral 66.

We offer excellent starting salaries depending on experience, and our other benefits include a profit-sharing bonus scheme.

We are located in a convenient part of Dorset, close to Bournemouth and the coast, and where appropriate, we provide generous assistance to enable you to relocate to this area.

For immediate consideration send details of your qualifications, experience and salary expectations to

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Ferndown Industrial Estate
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Tel. Ferndown (0202) 893535

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European leaders in Automatic testing

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PLYMOUTH, DEVON

SENIOR PROGRAMMERS

PROGRAMMER ANALYSTS

PROGRAMMERS WITH COBOL EXPERIENCE

We're the winners of the Western Regional final but it isn't only in track events that our teamwork excels.

In our working environment we are also geared up for any event with some of the most sophisticated techniques and software available.

Not only that, but our entire computing function is about to be reviewed with substantial investment in a major up-grade of Sigma 6 hardware.

To add to our winning team of professionals we need experienced people to be immediately involved in the development of several wide range projects. These include Data Base and Real-Time On-Line facilities via VDU's using COBOL as the main language.

So, if your experience in programming would fit into our team we will be more than delighted to put back some energy into your computing career.

For further details write to: Mrs. V. Apps, Central Services Personnel Manager, The Rank Organisation Limited, 438-448 Godstone Road, Whyteleafe, Surrey, CR3 0YG, or telephone Upper Warlingham 5491 (reversing the charges).

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Our Cliant's laading position in tha Europaan Tima Sharing Markat is based upon its success in offaring a powarful, highly-raliabla Communications Sarvica.

Following increased sales thay now wish to augment their Natwork Trouble-shooting team.

Tha successful candidata will hava:

- ★ Expariance of natwork-control techniques, probably having gained this in a sanior position in Oparations.
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Tha challange will ba to act as a technical trouble-shooter/consultant in pre- and post-sales situations, as wall as assisting in the davalopment of naw natwork facilities.

Caraar prospects and continuous training, in an environment of kaan profassionalism, ara imprassiva, and raflact the vast tachnical rasourcas and attituda of this International Corporation.

Raf: CW/6/2

CONTACT: Dave Scarlett ON: 01-935 0671

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Freepost, Equity and Law House,
35-37 Great Charles Street Queensway, Birmingham B3 2BR

MANCHESTER 061-833 0427
Freepost, Blackfriars House, The Parsonage, Manchester M3 2BB

LONDON 01-935 0671
Freepost 6, 102 Blandford Street,
London W1E 1JZ

Computing Services Association

SOCIAL SCIENCE GRADUATES

TEMPORARY APPOINTMENTS

Applications are invited from social science graduates for a temporary Scientific Officer post with the Social Science Research Council. Initially the appointment will be for up to 6 months with the possibility of renewal for a further six months and the successful candidate will work as part of a team providing the Secretariat for the Computing Committee, as well as the Management and Industrial Relations Committee.

Applicants should normally be under 27 and have a good honours degree in a relevant subject. Training, research in...or experience of social science computing is desirable, as also would be experience in administration.

Salary scale £3304-£4880 p.a. (including Inner London Weighting and Pay Supplement). Salary may be above the minimum depending on class of degree and experience.

Application forms and further details may be obtained from: Mrs. Vera Bishton, Social Science Research Council, 1 Temple Avenue, London EC4Y 0BD. Tel. 01-353 5252 ext. 110. Ref. T80/CW.

Closing date for applications 30th June, 1978.

KILBURN POLYTECHNIC

PART-TIME LECTURERS

EITHER DAY OR EVENING

for Certified Accountants Courses in the following subjects

FINANCIAL MANAGEMENT
AUDITING & INVESTIGATIONS
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AUDITING
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DATA PROCESSING
ECONOMICS

Application forms may be obtained from the Head of Department, Business and Professional Studies, Kilburn Polytechnic, Priory Park Road, N.W.6. Tel. 01-624 0022.

Systems and Programming Staff

£5000 to £10000 PLUS
- •Profit Share
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- •Holidays 21 to 26 days

CMG (City of London) Ltd. is the specialist subsidiary of the CMG Group – one of the leading European computer service organisations with a turnover currently in excess of £8M p.a.

THE PEOPLE we are looking for will be currently earning £4,000-£8,000 p.a., have had 3-5 years experience in a systems and programming environment and be looking for the opportunity to develop their basic experience gained to date in one or more of the following areas:

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Please telephone for an application form between 0830 and 1800 or write to:
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London E1 8EY 01-481 3881

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UK & OVERSEAS OPPORTUNITIES

PROGRAMMERS
MIDDLE-EAST COUNTRIES

Our client is a major international organisation with offices throughout the world. They seek programmers and analysts in BAHRAIN AND JEDDA where their market is growing strongly. Ideal applicants will have COBOL and/or NEAT experience on NCR small business machines, particularly 399 and 499 to work on an interesting variety of planned projects in a financial and commercial environment.

- ★ Renewable one year permanent contract.
- ★ Fully furnished accommodation provided at the company's expense.
- ★ 30days' LEAVE per annum.
- ★ Salary: Paid in Bahrain Dollars £12,000 circum TAX FREE.

Ref. 1883

IBM PROGRAMMER
HERTS.

Our client a sophisticated computer and technology company has openings for a number of experienced programmers. Candidates should have at least two years' experience on any high level language. Company offers:

- ★ Development of real time systems
- ★ Excellent career prospects
- ★ Exciting and interesting work in up to date technology
- ★ Subsidised lunch, pension scheme plus other company benefits
- ★ Salary £6,000

Ref. 1802

IBM PROGRAMMERS
SURREY

Major UK company wishes to strengthen its successful programming team. Retaining IBM 370 under DOS VS, they seek people with at least 18 months' COBOL experience to enhance their existing projects and to program new projects. Co. offers:

- ★ TRAINING in DL1 and CICS
- ★ Career prospects
- ★ Good working conditions
- ★ Salary to £5,500

Ref. 1851

HONEYWELL ANALYST PROG
LONDON

Manufacturing company producing a wide range of household goods is seeking an analyst prog with at least two years' COBOL experience. The successful applicant will join a professional and enthusiastic team utilising Honeywell Mainframe and preferably had GCOS experience. Co. offers:

- ★ Excellent working environment
- ★ Good career prospects
- ★ Life Ass., SUPA, LVs, and 4 weeks hols.
- ★ Discount on all company products
- ★ Salary to £8,000

Ref. 1493

PROGRAMMER
BELGIUM

Our client is a major organisation providing comprehensive marine engineering and construction services to companies engaged in Hydrocarbon development. Retaining IBM 370 under DOS/VS they seek a person with four years' COBOL exp. with PL/1, RPG or ASSEMBLER on asset. Co. offers:

- ★ Variety of projects in rapidly expanding co.
- ★ Centrally based — BRUSSELS
- ★ English speaking environment
- ★ Settling in allowance for married or single persons
- ★ Salary approximately £18,000 p.a.

Ref. 1474

MINI PROGS
CITY

Our client, a well established financial group, is setting up a new company to deal with a rapidly expanding area. This is a super opportunity for progs with experience on any mini hardware. BASIC would be an advantage but they will train on their own new language. If you want a CHALLENGE and to be involved right from the beginning phone NOW. Co. offers:

- ★ TRAINING in RSX11M and RSTS.
- ★ Great career prospects — promotion on merit.
- ★ Banking perks, free Life Assurance and LVs
- ★ Salary to £6,000

Ref. 1662

JUNIOR PROG
LONDON

Our client a prestige commodity brokers with officers throughout the world, are seeking PL1 programmers. They retain IBM 370 hardware and if you have 1 or more years' experience apply NOW for this fantastic opportunity. Co. offers:

- ★ TRAINING in other high level languages
- ★ TRAINING in software
- ★ TRAINING in systems generation
- ★ Salary £4,500 to start

Ref. 1818

IBM PROGS
LONDON

Our client, a prestige Bank, are recruiting programmers with at least 18 months' COBOL experience. Retaining IBM 370 under DOS VS. This is a great opportunity for a competent and ambitious programmer to join a professional team, Co. offers:

- ★ EXCELLENT promotional prospects
- ★ TRAINING in CICS
- ★ Excellent working conditions
- ★ Salary to £5,000 + CHEAP MORTGAGE

Ref. 1386

SENIOR ANALYST
MIDDX

Our client, a major organisation, situated close to both M4 and M3 motorways, is seeking a senior analyst to act as PROJECT LEADER on a wide range of applications. If you have approx. three years' systems experience, preferably in ICL 1900 series environment, and are able to demonstrate a professional approach to project management apply NOW! Co. offers:

- ★ Job security with a prestige concern
- ★ Responsibility
- ★ Excellent working conditions
- ★ FREE lunches, free Life Assurance
- ★ Salary £6,500 + company car

Ref. 1629

ANALYST PROG
HOLLAND

Our client is a major organisation meeting the ground power needs of world's airlines by engineering a broad range of products to clients in more than 100 nations. Retaining Honeywell 62/40 under GCOS, they seek persons with 2/3 years' COBOL exp.

- ★ Responsibility as the No. 2 to the DPM
- ★ Lots of user liaison
- ★ Variety of interesting applications with Honeywell IMS package
- ★ Excellent fringe benefits
- ★ Salary DFL 42-48,000 (£12,000)

Ref. 1838

MANAGER
LONDON

Prestige city company seeks No. 1 person with dynamic personality and sound D.P. experience to take role of manager. Successful candidate should have worked in an ICL installation and hopefully insurance background.

- ★ General management of D.P.
- ★ Sound programming & analysis
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- ★ User contact
- ★ Salary £10,000

Ref. 1887

ICL PROGRAMMERS
LONDON

Due to development of their advanced computer systems, successful D.P. services dept. seeks to boost its programming team. Retaining large ICL 1900 equipment they offer excellent opportunities for persons with min. two years' ICL COBOL exp. Co. offers:

- ★ Opportunity to join at senior level
- ★ Training on IDMS database
- ★ Development to analysis
- ★ Applications in various areas providing an absorbing and interesting career
- ★ Exc. perks include flexi-hours and 5 WEEKS HOLIDAYS

Ref. 1648

ANALYST PROG
CITY

Fantastic opportunity to join world-wide financial concern retaining IBM sys 3 for analyst programmers at varying levels with minimum 2 years' RPG11 experience.

- ★ Opportunity to attain PROJECT LEADER level
- ★ Training on CCP
- ★ Newly planned projects
- ★ Exciting growth potential
- ★ Salary to £6,500 + perks

Ref. 1647

JNR PROGS
LONDON

Challenging careers await persons with approx. 12 months' programming experience on ANY MACHINE, ANY LANGUAGE, with drive and enthusiasm who want to follow a positive career path. Opportunities as follows.

- ★ Training in T.P. and Database.
- ★ Development work on new sophisticated systems
- ★ Career progression with forward thinkers
- ★ Up-to-date technology
- ★ Salary to £4,600

Ref. 1650

SNR ANALYST PROG
DUTCH/BELGIUM BORDERS

European division of American manufacturing co. seek potential EDP manager with personality, drive and enthusiasm for their PDP-11 installation. Applicant should have substantial amount of years in systems analysis and programming on PDP-11s with a good working knowledge of MUMPS. He/She will be involved in design + implementation of commercial + Statistical systems integrated databases.

- ★ English speaking co.
- ★ RSX11-M operating system planned for implementation early next year.
- ★ Salary to DFL 55,000 (£14,000 approx.)

Ref. 1545

SNR ANALYST PROG
WEST LONDON/BERKS

International company with outstanding reputation for efficiency, growth and investment are seeking senior analyst programmers to work within IBM 370 installation. Good experience of PL/1 or COBOL or ASSEMBLER is essential with ability to work on own initiative and supervise staff. Working on teleprocessing and time-sharing systems with opportunity to work on small business machines. Co. offers:

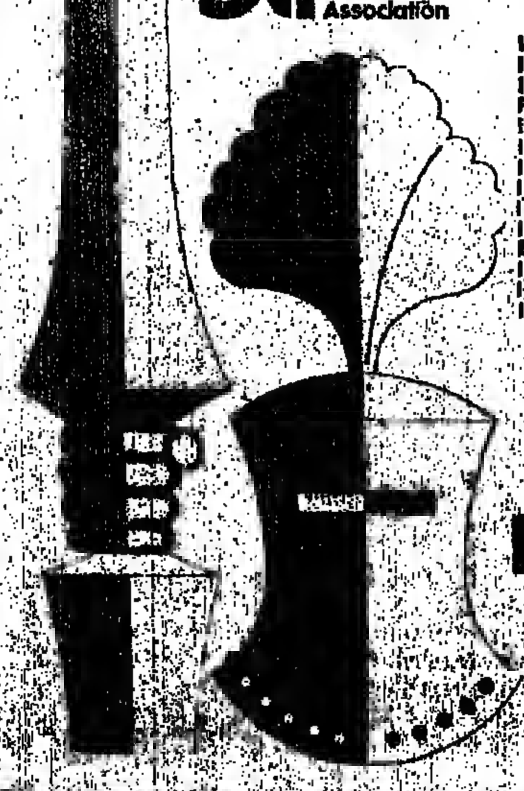
- ★ Exciting growth potential
- ★ Excellent promotion prospects
- ★ Non-contributory life assurance sickness and pension scheme
- ★ Good working conditions
- ★ Salary to £8,000

Ref. 1888

For details of the above positions either telephone or write to our London Office: 01-734 0162/3010 (24 hrs.)

CONTRACT DIVISION

Computing Services Association



U.K. CONTRACTS

IMS DL/1 PROGS	N. LONDON	£220+p.w.
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IBM RPG-11 DOS/VS PROG	SUSSEX	£200 p.w.
BURROUGHS 3700/1700 COBOL	C. LONDON	£200 p.w.
ICL 1900/2900 COBOL	MIDDX	£190 p.w.
ICL 1900 G11 COBOL	SURREY	£180 p.w.
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OVERSEAS

AN/PROGRAMMERS PL/1 FRENCH SPEAKING	PARIS	£300 p.w.
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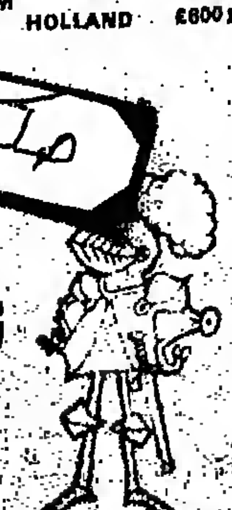

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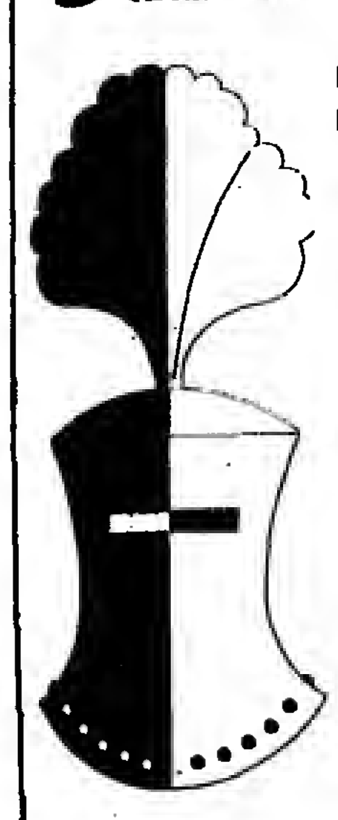
OFFICES AMSTERDAM, PARIS, MANCHESTER, BIRMINGHAM

Computing Services Association



CONTRACT MIDLANDS & N. ENGLAND

IMS DESIGNERS DB/DC	MIDLANDS	£280 p.w.	ICL GII COBOL	MANCHESTER	£200 p.w.
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Telephone 061-833 9341 (Manchester), or 021-236 1794 ext. 223 (Birmingham)

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COMPUTER DEVELOPMENT LEADER

Our client is a medium-sized engineering company based in North Cheshire and part of a well-known international Group.

The Company has an imaginative plan for extensive computer development during the next three years and the first stage of this development is now underway with the introduction of a communication based ICL 2903 configuration to replace the existing 1901A configuration.

Technical involvement at the system design stage and in the programming of the more complex elements of the system will be essential as will the ability to supervise the activities of any third party software houses engaged. There will be liaison with other management departments.

Previous systems experience (preferably in a manufacturing environment, together with fluency in COBOL, are therefore the essential qualities required. You must be at home with the 2903 range and its operating systems and have a good working knowledge of communications.

Salary will be commensurate with experience and qualifications and other conditions of service, including a contributory pension scheme and free life assurance, are first class.

Candidates, male or female, should apply in the first instance, giving details of age, experience and present salary, to . . .

The Appointments Manager
Chetwynd Streets Advertising Ltd.
Dennis House
Marsden Street
Manchester, M2 1HT

A PROGRESSIVE COMPUTER BUREAU, SOUTH WEST LONDON, is looking for a

D.P. CONTROLLER

Applications are invited for this post which has extremely good prospects for a self-motivating and enthusiastic person. The person appointed will be in charge of a HONEYWELL level 62-40 with 6 terminals and 224k memory whose primary purpose is to service the parent company needs and also enter the expanding series 60 bureau market.

Suitable applicants will have had Commercial systems and programming (COBOL) experience, preferably with HONEYWELL series 60 although this is not essential and must have had management experience.

This post has extremely good opportunities for a person seeking success and will be rewarded accordingly.

We are willing to pay a top salary to right person with good background and experience. Company operates on contributory pension scheme.

Applications in writing will be treated in strictest confidence.

Finance Director
V. A. HOWE AND COMPANY LTD.
88 Peterborough Road, London, S.W.6 3EP

ANALYST/PROGRAMMER

W.1. C £6,000

International organisation buying merchandise for major U.S retail group requires Analyst/Programmer to complete our small systems team.

We should particularly like to hear from COBOL Programmers who can establish user requirements and prepare program specifications for small/medium systems. Areas of experience that would be helpful are.

- ★ 2-3 years' Cobol experience
- ★ Systems investigation
- ★ User liaison
- ★ Order processing
- ★ Retailing

This is an opportunity to join a small professional EDP group utilizing a bureau based S370/158 operating in an OS environment.
Excellent non-contributory benefits including BUPA, pension and life assurance, 50p LVs daily, and interest-free season ticket loans.

Contact Peter Lnkay
May Department Stores International
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LONDON, W.1
01-837 4300

Knight is right for contract staff

Knight Computer Services Ltd.,
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London W1Y 4NL

Knight **01-491 4706**

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Female/Male assistant
to
SENIOR ASSOCIATE
within own business.
Phone
VIP CONSULTANTS INTERNATIONAL
01-491 3260/493 5095

STANDGE TECHNICAL COLLEGE,
Park Road, Uxbridge, Middx.

Department of Science & General Studies

LECTURER (GRADE II)
In Computing

WESTFIELD COLLEGE
(University of London)

TEMPORARY LECTURER IN COMPUTING SCIENCE

Applications are invited for a temporary Lectureship in the Computer Science Department for a three-year period with effect from October 1, 1978. The appointment will be made on one of the first three points of the lecturer scale (up to £4166 plus £450 London Weighting).

Applications (6 copies) should be sent as soon as possible to Dr. J. Buckingham, Personnel Officer, Westfield College, Kidderpore Avenue, Hampstead, London, NW3 7ST. Further details about the work of the Department can be obtained from Dr. P. E. Osmon, Tel. 01-435 7141, Ext. 521.

IF YOU ARE A
Fortran - Cobol - PL/1
Plan - RPG II
PROGRAMMER
Ring: **VIP CONSULTANTS INTERNATIONAL**
01-491 3260/493 5095
NOW! (Agency)

CAPITAL APPTS.

GRADUATES

Urgently required for trainee positions. Industrial, Scientific, Commercial Situations. Salaries c £3,000
ALL AREAS

28 Windmill St. London W.1.
637 5551 day; 636 9659 eve

Microcomputing in Dataskil

£4.0K – £7.5K

Dataskil needs men and women with experience in high speed real time computing on mini and microcomputer hardware. Ideally you will have experience as a programmer, a systems engineer, or system analyst in one or more of the following areas.

- Data Communications handlers
- Process Control
- Air Defence Systems
- Air Traffic Control
- Radar or Sonar analysis
- Radar or Sonar simulation
- Control and Guidance systems (weaponry)
- Control systems for Field Artillery
- Machine tool control
- Environmental Simulators

You should understand computers and enjoy the idea of stretching them to their limits. Specific machine and language experience is not an immediate consideration. However, CORAL, ALGOL, or FORTRAN are desirable. Where necessary training will be provided. The quality that candidates must bring with their application is an enthusiasm for 'real' real time computing.

In return we can give you the challenge of a job which offers considerable variety in a number of customer locations. You will appreciate our informal way of working and our ability to adapt to your individual career requirements. If you are adaptable and mobile, and possess good communication skills, your career opportunities with Europe's leading software services company are excellent.

Write, giving details of yourself and your career to date, quoting reference C1879 to Mr. C. C. H. Dennis, ICL Dataskil, Reading Bridge House, Reading, Berkshire, or phone him at home during evenings and weekends on Radlett (09276) 7511.

ICL Dataskil
The Computer Professionals

ANALYST/PROGRAMMER — EIRE
c.£5,000

One of our customers has asked us to assist in the selection of an Analyst Programmer to assist in the implementation of a 2903/40 system. Ideally the person selected will have the following experience.

- ★ Experience of 1900/2903
- ★ 2 years' COBOL programming
- ★ Should have been involved in the implementation of one major system.

In return the following benefits will apply:

- ★ Attractive salary and conditions
- ★ Pleasant surroundings — one hour's drive from Dublin
- ★ In at the ground floor of development
- ★ Progress to on-line processing in the future.

Write or phone for application form to: **Mrs M. McGee**
INTERNATIONAL COMPUTERS LIMITED
ICL House, Adelaide Road, Dublin 2 Telephone No. 756761

Opportunities in Computer Programming

A far-reaching programme of work and computer enhancement has created opportunities at our head office in Surrey for people looking for career progression and job satisfaction, tackling the challenging problems arising from our development plans. The present installation consists of a large ICL 1904A configuration which will be replaced by dual ICL 2960's in January 1979, with future emphasis being placed especially on database and communications potential.

The people we need should have a capacity for original and logical thought and the initiative to work with minimal supervision. We give comprehensive training and recognise individual potential for development on to systems analysis work. Programmers are encouraged to use their ability and experience to contribute as much as they can to the design and planning stages. Promotion is based entirely on merit and the senior positions in the department are almost invariably filled from within.

Candidates should either have relevant programming experience or be suitable for a post as trainee programmers, ie, of degree standard or with a successful career background.

An attractive starting salary is offered which is dependent upon age, qualifications and experience.

Excellent conditions of employment include contributory pension fund, free life assurance and all the benefits of working for a large organisation. We operate a Flextime system and have an excellent sports and social club.

Please write or telephone for an application form from

MMB

The Personnel Officer
Milk Marketing Board
Thames Ditton
Surrey KT7 0EL
Tel 01-398 4101.

Corporation of London
Guildhall, E.C.2

PROGRAMMER

£4183-£5954

(Salary review July 1978)

The Corporation of London is seeking a Programmer to join a team of five other programmers in its installation which is responsible for a wide range of financial and non-financial systems. For example, Integrated Accounting System, Rate and Rent Collecting System, Stores, School Fees, Payrolls, etc., together with Traffic Tickets, Register of Electors and Examination System, etc.

The successful candidate should have 18 months of COBOL or PLAN programming experience and will be given in-house training and further external training as necessary. The general environment is such that a broad base of expertise can be obtained from the installation. Both COBOL and PLAN languages are used.

The salaries are inclusive of a salary supplement of £312, special supplement £477 and the 5% Phase II salary adjustment, and will be commensurate with experience. Annual increments are then granted up to the scale limits. Other benefits include generous holidays, superannuation scheme, season ticket advances, subsidised staff restaurant and resettlement advances in approved cases.

The installation comprises an ICL 1902S 48K store processor, 3EDS, 4 tape decks, etc. and GEORGE 2 operating system is in use.

Applications with details of working experience and Academic passes, or enquiries, are invited and should be addressed to:

Computer Services Manager
Guildhall, London, EC2P 2EJ

Computer Programmer
Research

This appointment offers the chance to join a new pharmaceutical research organisation which is part of one of the world's largest chemical companies. We are seeking to appoint an Analyst Programmer within the Computing Services Group to develop and maintain a variety of software to meet all the data processing and statistical needs for a multidisciplinary group of life-scientists.

The central hardware consists of a Hewlett Packard 21 MX(E) computer with the 50 MB HP 7920 disc linked to a HP 2100 computer and HP 7900 disc. Appropriate peripherals are mostly distributed through the laboratories in accord with our policy of on-line capture and central processing of all data. The scientific disciplines to be serviced include synthetic chemistry, drug analysis, pharmacokinetics, drug metabolism, pharmacy, immunology and information services. A fully equipped electronics laboratory supports this function by the provision of micro-processor based interfaces and other devices as required.

The successful candidate, male or female, will therefore have a minimum of five years experience in a scientific and/or statistical environment and be fully conversant with Fortran and Basic languages. A formal knowledge of statistics would be an added advantage.

A first class salary will be paid, conditions of employment are excellent and our benefits package is of the standard expected from a major international company.

Please write or telephone for an application form to:-

Mrs. M. C. Hannay, Personnel Services Manager, Hoechst UK Limited, Walton Manor, Walton, Milton Keynes, Bucks. (Telephone Pinehem 5068)

Hoechst

Senior Analyst

Manufacturing Systems
West of Scotland

for an important engineering group of US parentage employing over 300 people in the manufacture of process plant for UK and European markets.

An ambitious programme of new and extended computer applications is under way; current projects include production and materials planning, inventory control, productivity improvement, cost reduction and output statistics for management information.

Candidates, aged 30 to 45, must have at least five years' manufacturing systems design experience. Initial salary negotiable with attractive benefits including relocation, if appropriate.

Please write with brief details – in confidence – to W. J. O. Michie ref. FY32543.

This appointment is open to men and women.

MSL Management Consultants

Management Selection Limited
14 St. Vincent Place Glasgow G1 2EU

Portsmouth Polytechnic
Computing Centre

Lecturer II/ Senior Lecturer in Computer Science

Applications are invited from graduates specialising in systems programming and program language theory. The successful candidate will be required to lecture, principally at degree level, and will have the opportunity to participate in the research and development activities of the Computing Centre.

Salary scale £4101 to £6501 (efficiency bar) to £7572 per annum

Research Fellow in Systems Programming

The Computing Centre is engaging in collaborative work with International Computers Limited in the systems programming field.

The work is based on an ICL 2904 educational computer which is to be linked to the ICL 2960 which is the main service computer of the Polytechnic.

In connection with this activity, applications are invited from men and women for the position of Research Fellow from graduates with experience in systems programming. The post is of two-year duration, with possible renewal.

Salary scale £4218 to £4232 per annum.

Application forms and further particulars may be obtained from the Staff Officer, Portsmouth Polytechnic, Alexandra House, Museum Road, Portsmouth, PO1 2QQ, to whom completed applications should be returned by June 30, 1978, quoting ref. F21.

SOUTH LONDON

PROJECT MANAGER

DMS 1100

8-10K+

BONUS — CO. CAR

INTERNATIONAL TRAVEL

THIS OUTSTANDING PROJECT MANAGEMENT opportunity is available to candidates who have an intimate knowledge of UNIVAC Software, especially DMS 1100. Applicants should possess the personality capable of interfacing between technicians, THE COMPANY and their Clients.

The Project Manager, who will be the "King Pin" of this MULTI-MILLION Pound contract, will need the SKILL, DRIVE and EXPERTISE to ensure successful completion of every stage of development to implementation.

A worldwide communications network is envisaged and the Project Manager will advise and consult with the Company's clients — WORLDWIDE.

Our client's operation has grown into one of the largest and most successful computer services organisations in Europe with a multi-million pound turnover. They have a customer base in excess of 1,200 users with a network embracing the major continental cities.

Scope for further advancement is assured and the successful candidate can look forward to a stimulating and exciting future.

The salary is negotiable between £8000 and £10000 per annum, plus bonus, company car, expenses and other excellent benefits. If appropriate our clients will assist with relocation expenses.

For further information and a confidential discussion please telephone or write to: Dean Williams, quoting reference no. CW185.

Insight Marketing & Personnel Consultants Limited
72-75 Marylebone High Street
London W1M 4AJ
Telephone No. 486 5644

At its London headquarters, the Authority operates two IBM 370/148 Computers connected to a large (150 terminal) teleprocessing network covering the principal centres of population in the Region.

Interesting developments in this network are in hand involving the evaluation of IBM's Series/1 and similar equipment.

The software environment is VM with DOS/VS, OS/VS1 and CMS. The teleprocessing monitor is SHADOW with TP programs written in IBM Assembler. Batch work is handled almost entirely by Informatics' MARK IV file management system. Applications are invited from suitably qualified persons for the position of:

Project Leader
Program Development
£6,834 - £7,302 PER ANNUM
(Currently under review)

The successful candidate will manage a team of system analysts and programmers in the day-to-day maintenance and production of new suites of programs to installation standards. Four years' experience of programming and system analysis, two in a senior role, are a minimum requirement. Knowledge of Informatics' MARK IV and IBM's Basic Assembler Language would be an advantage, although more weight will be given to evidence of leadership and organising ability.

35 hour week.
Generous holidays.
Pension Scheme — Interchange arrangements.
Staff restaurant.

Applications, quoting reference CW and giving full particulars of age, educational qualifications and previous experience should be sent not later than (10 days from publication) to Laurence O. Wild, C.Eng., F.I.C.E., F.I. Mech.E., F.I.W.E.S., Division Manager, Room 650, Thames Water Authority, Metropolitan Water Division, 173 Rosebery Avenue, London, E.C.1.

THE POST IS OPEN TO MALE AND FEMALE APPLICANTS.

Thames Water

Line Controller

c£4500
+ Preferential Mortgage Facilities
Bexleyheath N.W. Kent

The Woolwich, which is one of the country's largest building societies is enhancing its teleprocessing system to support its branches throughout the U.K.

The Society wishes to recruit a Line Controller who will assist in the operational running of what will ultimately be a large IBM based data communications network.

Candidates should preferably be educated to 'A' level, although good 'O' or CSE levels will be acceptable. Previous experience of controlling a data communications network is essential.

A comprehensive remuneration package accompanies this position including a preferential mortgage facility and excellent pension scheme. Relocation expenses may be paid where necessary.

Please ring Mr A. Hughes — Network Controller, on Crayford 526232 Ext 503 (day) or 01-653 8191 evenings/weekends. Alternatively please write to the above for further details or application form at Woolwich Equitable Building Society, 30 Erith Road, Bexleyheath, Kent, DA7 6SP.

WOOLWICH
EQUITABLE BUILDING SOCIETY

DECISIONS, DECISIONS.

Three great places to work, and plenty of work to get your teeth into. At Westinghouse we are at the forefront of innovative technology in the use of computers for railway systems, mining, and process controls. Our order books are growing and we need ambitious (and we mean ambitious) software staff to work on a variety of projects involving mini and micro computers, real time process control and monitoring, CAD linked support systems etc. We've got a wide range of machines: HP, NOVA, DEC; and languages: CORAL 66, RTL 2, ASSEMBLER, FORTRAN etc.

We're currently looking for:

Project Leaders
Analyst/Programmers
Programmers
Senior Systems Analysis
Systems Analysis

The jobs are based in Chippenham, Bracknell and Wokingham. You make the decision where you want to work – in any place you'll find the work challenging and absorbing.

If you're really good at problem solving and want to gain more experience in a company known worldwide for its innovations in modern systems then Westinghouse is the company for you.

Write today to: P.A. Murley, Company Personnel Officer, Westinghouse Brake and Signal Co. Ltd., FREEPOST, Chippenham, Wilts. Telephone Chippenham (0249) 4141

WESTINGHOUSE
Brake and Signal Co Ltd Chippenham Wilts

Advanced Technology in Chippenham, Wokingham & Bracknell.

Computer Systems Management

£5,500-£6,500

Outgrown your present job? Prospects looking bleak? If you are seeking professional challenge and career development in a progressive, forward-thinking company then your next move should be to Hilti.

We are part of an international marketing organisation and in the UK we're number one in supplying an advanced range of cartridge tools, fastening systems, and drilling machines to the construction industry. Sophisticated management services play an important part in keeping us out in front of the field and we now wish to appoint a Systems Manager, male or female, to strengthen the data processing team.

Age is not critical, but you will need solid experience of COBOL and systems analysis coupled with a creative thinking approach and a flair for communication. For an analyst or team leader (preferably having managed at least one major project) this is a first-class opportunity to gain broader experience of project control and men management.

Ring Graham Allington, Personnel Training Officer, on 061-872 5010 or write to him at Hilti (GB) Limited, Hilti House, Chester Road, Manchester M16 0GW.

HILTI

P.E.R. Recruitment Consultants

Calling Programmers Contract & Permanant
TEL 0565 4925 TODAY!

Gemini Contracts

EURO UK

contract opportunities for experienced programmers

—Register with an International Software Organisation

Telephone 01-828 6634 or evenings 0908, 562745

CITY OF MANCHESTER Treasurer's Department

COBOL PROGRAMMERS
ANALYST PROGRAMMERS

STAFFORD BOROUGH COUNCIL

COMPUTER TECHNICIAN

(Up to £4,214 p.a. inclusive)

The successful applicant to the above newly established post in the TREASURER'S DEPARTMENT, will initially be involved in the programming/systems work associated with the progressive transfer of financial applications from a mainframe to a recently acquired mini-computer.

The appointment will rank second in a small team having responsibility for the setting up and running of the Council's new computer installation.

Salary Grade A.P.4 (£3,861-£4,214 p.a. inclusive of salary supplements). Lodging/travelling allowance, and payment of removal expenses/legal fees in appropriate cases.

Job description and application form obtainable from Personnel Officer, Borough Secretary's Department, The Hollies, Newport Road, Stafford, ST16 1BE. (Tel. Stafford 3181, Ext. 216) quoting [illegible]

UNIVERSITY OF LEICESTER

SYSTEMS ANALYST/ PROGRAMMER

THAMES POLYTECHNIC
Computer Centre

COMPUTER OPERATOR

Applications are invited for the post of Computer Operator from persons with at least five GCE "O" level passes, or equivalent. Some knowledge of computer operations would be an advantage but training will be given to a suitable person. Commencing salary up to £3,720 per annum inclusive (Salary award under review).

Details and application form (to be returned by 13th June, 1978) from the Staffing Officer, Thames Polytechnic, Wellington Street, London SE18 6PF (01-854 2030 Ext. 433).

NORTHERN ENGLAND

CONTRACT PROGRAMMERS

Salary: £7,800-£10,000 per annum (Dependent on experience).

Immediate or up to 2 months' start for

370 COBOL PROGRAMMERS
H66, TDS or IDS COBOL PROGRAMMERS
H2000/66 COBOL PROGRAMMERS
VENTEC PROGRAMMERS
PLAN PROGRAMMERS
ASSEMBLER PROGRAMMERS

We offer continuity of work to all our contract staff and salaries are sent out every 2 weeks. A min. of 2 [illegible] is required for all assignments.

Please write or telephone, Lee Richfield Ltd. (Computer Recruitment Consultants), Bridge Buildings, Ladybridge Road, Cheadle Hulme, Cheshire.

Daytime: 61-485 0581; Evenings/weekends: 061-580 8875

NORTH WEST THAMES REGIONAL HEALTH AUTHORITY
CHARING CROSS COMPUTER PROJECT

HOSPITAL COMPUTER PROJECT MANAGER

(Male or Female)

SALARY SCALE £8706-£8647 PER ANNUM
(Scale 23)

(INCLUDING LONDON WEIGHTING AND SUPPLEMENTS)
(INCREASE PENDING)

A vacancy exists in the Department of Medical Computing Science, Charing Cross Hospital (Fulham) for a Hospital Computer Project Manager to take control of the development, introduction and continuing operation of computer systems at the Charing Cross Hospital, and later at other hospitals in the Ealing, Hammersmith and Hounslow Health Area.

The successful applicant will be accountable to the Regional Computing Services Officer, but will have local responsibility to the District Administrator, South Hammersmith, for the provision of computer services.

Application forms and further particulars from the Regional Personnel Officer, North West Thames Regional Health Authority, 40 Eastbourne Terrace, London W2 3QR [illegible]

INDIA

MARKETING MANAGER
SENIOR SYSTEMS ENGINEER
SENIOR HARDWARE ENGINEER

A prominent Indian manufacturing company has recently formed a new division to build and distribute on a world wide basis an advanced commercial microcomputer.

Interviews for the above positions will be held in the London area, on June 23, 1978 with the Indian Principal present.

These opportunities, offering excellent salaries and fringe benefits, are open only to Indian nationals.

Applicants should telephone Mrs. D. Stanley at Guildford 810748 to arrange an interview.

Borough of Gosport

Senior Computer Operator

(£2,863-£3,773 per annum)

To work in Borough Treasurer's Department for ICL 2904.

Consideration will be given to housing accommodation and relocation expenses.

Application form and further details from Borough Treasurer, PO Box 4, Town Hall, Gosport, Hampshire (or telephone Gosport (070 17) 84242 ext 102)

TEHRAN

DON'T BE SHORT-CHANGED CHECK YOUR PACKAGE AND YOUR CAREER

HIGH TAX FREE SALARIES PLUS FAMILY ACCOMMODATION AND OTHER SUBSTANTIAL BENEFITS

If you have Honeywell 6000 or Level 66 experience and are considering a term in Iran, then here are the best opportunities available. My client is one of the USA's leading Honeywell systems software companies and as such is able to offer the top package for Tehran.

Consider the following:

TAX FREE SALARY

— A generous tax free cash income of between $27,920 p.a. and $33,680 p.a. for personnel with 4-8 years' applications experience. Higher salaries are available for more senior and specialised positions.

ACCOMMODATION

— The company provides a separate apartment for EACH employee, the size of which varies according to the family.

— The company pays for all utilities, e.g. gas, electricity, etc. with the exception of the telephone.

— The company provides a good standard of furnishings for the apartment including television, washing machine, fridge/freezer, etc.

N.B. The company budgets for an average of $17,000 to cover first year rental and furnishings for EACH apartment.

ADDITIONAL BENEFITS

— The company provides home to office transportation
— The company pays local school fees for children over 5
— The company pays Medical Insurance
— The company pays emergency home leave where necessary

HOME LEAVE

— The contract is for 18 months' duration and a family trip home is paid for after 12 months.

JOB CONTENT

— The company has been awarded a substantial contract due to its reputation for systems and software development based on Honeywell computers. The scope of this project ensures a high level of job satisfaction.

FUTURE CAREER PROSPECTS

— The company is a well established systems software house and NOT just a bodyshop. Consequently, they view each new appointment as the start of a long term career through an initial assignment in Tehran. In addition to IRAN, future opportunities exist in the USA, UK and EUROPE.

REQUIREMENTS

PROGRAMMER/ANALYSTS

— Minimum of 4 years' good experience in COBOL with applications knowledge of GCOS and JCL.

SYSTEMS PROGRAMMERS

— Around 8 years' experience in DP with extensive knowledge of GCOS, GMAP, TDS and/or NPS.

DATABASE SPECIALIST

— Around 8 years' experience in DP with extensive knowledge of GCOS, IDS, TDS and database design.

CALL DAVID J. HUTCHINSON ON 01-499 4501 TO DISCUSS REF RW 24/1

THE BEST OFFER AVAILABLE

CREATIVE PEOPLE for a CREATIVE COMPANY

LONDON

My client currently operates a large twin IBM based bureau, specialising in systems for the advertising industry. They are soon to take delivery of an additional machine, a PDP 11/70 to cater for their expansion programme (future plans include ordering 2 more PDP 11/70s during the next 18 months). Enjoying the financial support of their parent public company, this thrusting young subsidiary employs approximately 60 DP staff. It has good internal communications, with highly visible senior management, and practices a "promotion totally on merit" policy. All the current systems are to be completely re-designed and rewritten to operate in an on-line environment.

PROGRAMMER/ANALYSTS

IBM DOS COBOL Up to £6000

Currently over 40 advertising agencies are serviced by these administrative and accounting systems. These systems are undergoing significant enhancements and development of new facilities towards a totally integrated package to cope with the needs of the advertising industry.

This interesting project requires self-reliant, young professionals who can enjoy a company atmosphere which encourages them to use their initiative and imagination to the full. The steady pressure of an assured workload will enable you to develop your skills at your own pace. Planned growth will allow the company to accommodate fast developers.

REF. RW 24/2

DEC PROGRAMMERS

£4000-£6000 Junior & Senior BASIC+

The installation of a large disc based PDP 11/70 and the probability of 2 additional 11/70s in the next 18 months give rise to a heavy development schedule. Very interesting projects are to be undertaken including sophisticated on-line systems for the booking of TV time. The machine will operate under RSTS and use RMS 11/K file management system.

Excellent opportunities exist for junior programmers to join a very attractive company and for senior programmers to gain highly marketable experience developing sophisticated systems in a technically advanced environment. All positions require some exposure to DEC programming, preferably BASIC+ under RSTS.

REF RW 24/3

RSTS SPECIALIST MANAGER

£ NEG

This person will be responsible for the generation and maintenance of machine software and the development of PDP applications programs by his team. He will be highly experienced in DEC systems and possess a thorough detail level knowledge of RSTS. This is a superb opportunity for a strong technician to develop his career into management through an interesting and challenging role.

CALL DAVID J. HUTCHINSON ON 01-499 4501 REF RW 24/4

hutchinson-scoggins recruitment
10 Dover Street, London W1X 3PH
Telephone 01-499 4501

Philips Telecommunications Computer Controlled Telephone Exchanges

The recent large order from Saudi Arabia has confirmed the position of Philips as one of the world leaders in the supply and manufacture of computer controlled telephone exchanges. This, plus enhancements and additions to the range of switching systems, coupled with the current rapid expansion of the department, has created vacancies within the U.K. part of the international development team working on these systems. The U.K. base for this effort is Malmesbury, Wiltshire where the laboratories of Philips Telecommunications and Pye TMC are located. The development effort extends into the fields of space and time division switching systems, local and trunk applications, integration of microprocessors, and network management centres.

Software Systems Designers Systems Programmers

£4,000—£7,000

Are required to work in real time telephony applications, basic operating system design and general support areas. At least two years programming experience preferably in assembler and control systems programming, is required for the systems programming vacancies. Four or more years experience in real time of control systems software design is required for the senior positions. Experience of telecommunications would be advantageous. Some positions may entail occasional short visits to our other laboratories in Holland and Belgium.

Malmesbury is in the south west corner of Wiltshire between the Marlborough Downs and the Cotswolds and combines a town of historic interest with all the amenities of a modern community. Motorway systems and quad class roads bring it within easy reach of most major towns and cities.

These are exceptional opportunities providing scope to develop your expertise.

First class salaries and conditions of service are offered and assistance with relocation will be given where necessary.

STOP PRESS
Job Opportunities also exist in Holland

Please write giving full details of career to date quoting Reference HC. to: John Thomas, Personnel Manager, Pye TMC Limited, Swindon Road, Malmesbury, Wiltshire SN16 9NA

PHILIPS

HERTS/MIDDLESEX

NOTICE TO SYSTEMS ANALYSTS

Haymarket Computing are D.P. recruitment specialists to 35 companies in the Herts/Middlesex area. Such is the current computer employment market that at any one time almost all of these companies have vacancies for Analysts and/or Programmers. At the present moment, however, our most urgent need is for Analysts on behalf of 12 clients in the following areas:—

Cockfosters	Stanmore
Borehamwood	Harrow
Potters Bar	Wembley
Waltham Cross	Southgate
Hemel Hempstead	Tottenham
Hayes	Luton

Salaries range from £4,600 to £7,300 covering all levels of experience from Juniors to Project Leaders.

For more information ring:
HAYMARKET COMPUTING LTD.
Tel: Cuffley (Herts.) 4130
up to 6.30 p.m.

MIDLAND RECRUITMENT FEATURE

Advertisers are reminded that on June 22 Computer Weekly is highlighting career opportunities in the Midlands with a recruitment feature.

To secure space in this important feature

Contact Alan Escott 021-356 4838 or John Farrar 01-261 8098

Copy deadline: 4 p.m., Friday, June 16

LOGISTIX
Data Processing Recruitment Consultants

PL/1 Programmers City of London

Salary: not less than 6K & up to 9K Plus Mortgage

An important International financial institution based in the city is expanding its team members and is seeking PL/1 programmers at all levels up to and beyond team leader level. Ideally, you will have around 3 years of solid PL/1 experience under O.S. and will either have on-line expertise or a desire to move into this area or Data base design through participation in our Client's training programmes.

Of particular importance is the ability to work as a member of a specialist project team under strict documentation and programming standards. A second language (COBOL or Assembler) would in addition be considered advantageous.
Our client offers a 2½% subsidised mortgage, personal loan scheme private health and a non-contributory pension plan. Interviews will be held in London during June.

Ref L12/A

Mini Communications E.E.C.

Salaries: £9.5—15K + exceptional benefits

A prestige International Client is seeking to expand and establish new project teams working on wide and varied applications areas with emphasis on Data Communications, Message Switching and Mini Software.
Existing and new project teams require Consultants, Systems Designers, Senior Analysts, Analyst/Programmers and Programmers with direct, relevant experience in at least one of the above areas of activity. In particular extensive Mini Computer Assembler experience is essential.
Successful candidates are likely to be aged between 22 and 35 with either a degree or equivalent (Computer Science or Maths) or extensive relevant experience in lieu.
You are certain to contribute valuable expertise to this prestigious group whilst expanding your own threshold of experience through working closely with other professionals at your own level.
Our Client will pay full re-location expenses for you and your family and provide a generous re-settlement advance in addition to meeting the costs of temporary accommodation pending location of permanent housing. Numerous other first-class benefits go to making this a very attractive opportunity.

Ref L12/B

IMS Data-Base London+E.E.C.

Salary: U.K. to 9K E.E.C. to 16K

Our client one of the 'Seven Sisters' Oil Companies has asked Logistix to assist in recruiting a number of IMS Data base specialists up to project leader level and beyond. The only pre-requisite incorporated in our brief is that candidates are able to demonstrate solid IMS Data base skills.
DL/1 is of course essential and if linked with PL/1, COBOL or Assembler will be of considerable interest to our Client.

This company is amongst the most advanced and sophisticated users of D.P. and should be regarded for its long-term career potential rather than as a stepping stone to greener pastures.
Fringe benefits normally associated with a Major Oil Company are offered together with other rewards of a more unusual nature. These are of course in addition to well above average salaries.

Ref L12/C

Banking or Financial Applications Switzerland

Salaries: £1,500 per month

We have urgent requirements for a team of four comprising two Programmers an Analyst and a Project Leader to work in Switzerland.
It is an absolute requirement that all applicants have considerable UNIVAC 494 hardware experience. Additionally, candidates with recent or current experience in a banking or other financial environment will be of special interest.
There will be an opportunity at the expiration of the project to relocate to West Germany, Spain or Scandinavia.
Interviews will be held in our office by the end of June, and offers to successful personnel made within seven days thereafter.

Ref L12/D

Copenhagen Communications

Salaries to £15K

We have several outstanding permanent career vacancies for Scandinavia's foremost hardware and software systems supplier.
Particular machine experience is not essential but those who have a solid background in message and telex switching, data communications and procedures will prove invaluable to the growth pattern this Company has set for itself.
However of especial interest are:

a) Mini-Computers	b) Mainframes:
(i) DEC PDP 11	(i) UNIVAC 1100
(ii) DG Nova/Eclipse	(ii) IBM 370
(iii) Prime 300/400/50 and	(iii) ICL New Range

Interviews will be held in our offices on Monday to Saturday, — 9.00 - 21.00 hours basis throughout the remainder of this month.

Ref L12/E

Logistix, Freepost 32, London W1E 3YZ
01 491 4636 (Reverse charges) **Telex 28800**
LOGISTIX
Avon House, 366 Oxford Street, London W1N 9HA

Senior Systems Analyst

LONDON c. £8,000

Our Client, a leading international engineering Company has a requirement for a Senior Systems Analyst to be responsible for the implementation of their Accounting and other commercial systems. It is envisaged that this will be achieved by a combination of software house and in-house effort. The successful candidate will be responsible for both a small team of in-house programmers and for co-ordinating and monitoring the work of the software house selected.

Candidates must have a proven record of major systems development using data base and transaction processing techniques.

The in-house computer system is a newly acquired large mini installation to be used both for technical and commercial applications. The operating system supports Fortran, Cobol, RPG and Basic Language Compilers and Total Data Base Management. It provides time sharing, transaction processing, batch and remote batch processing and communication capability.

Please write, in complete confidence to

Shapcrest Ltd Recruitment Consultants 33 Queen Anne Street, London W1M 0AL

SHIFT LEADER

CRAWLEY, SUSSEX **c.£4,000 (inc. Shift premium)**

We are an expanding international company, manufacturing high performance cells and batteries for a broad range of applications.

Evidence of our growth is significant in the D.P. area, where we will shortly be installing an IBM 370/138 to replace our existing 3/15 and require someone to take charge of one of our two shifts. The Crawley Computer Centre will control a network involving four other Computers throughout Europe and this rapid expansion offers a challenging environment in which to work.

If you have OS/DOS experience and require an interesting job, with prospects, find out more by contacting:

John Pelham, Computer Operations Manager or Kevin Elvidge, Personnel Officer on Crawley 26041.

Mallory Batteries Ltd., Gatwick Road Crawley, West Sussex

datascene

OPERATORS & DATA CONTROL

ICL 1900 GII SHIFT LDR £4200
Minimum 2 years' exp. required for this N.E. London installation. 2 shifts only. Perks include free meals.

IBM 370 OS SENIOR OP £4600
Central London based financial installation requires OS OPS with 2 years' exp. and some JCL knowledge. Excellent career prospects.

IBM 370 DOS SNR & JNR OPS £4400
1-2 years' exp. required for installation based in E. London. Excellent salary and perks including subsidised mortgage, loans and meals.

PDP 11 OPERATOR £4000
18 months' exp. required for a Merchant Bank in the City. Good career prospects and perks include Mortgage subsidy.

NCR B1-B2 OPERATOR/SENIOR OP £4000+
A minimum of 2 years' exp. required for this N. London site. 3 shifts and latest NCR hardware.

PRODUCTION ASSISTANT OS/VSI £4000
2 years+ exp. in data Control, plus a good working knowledge of JCL. Good career prospects plus Season Ticket Loans and free BUPA.

ICL	GII	SNR OP	18mths +	N. LONDON	£3600
ICL	GII	OPERATOR	1yr	W. LONDON	£3500
ICL	GIII	SNR OP	2yrs	C. LONDON	£4000
ICL	GIII	SNR OP	18mths	E. LONDON	£4300
ICL	2900	OPERATOR	1yr	MIDDX	£3500
IBM	DOS	OPERATOR	1yr +	C. LONDON	£3800
IBM	OS	OPERATOR	1yr +	C. LONDON	£4000
IBM	OS	OPERATOR	1yr +	CROYDON	£3700
IBM	OS	SNR OP	18mths	SUSSEX	£4000
IBM	DS	SUP(DAYS)	18mths	W. LONDON	£4200
NCR	B1	JUN OP	8mths	ESSEX	£3500
B3700	MCPV	OPERATOR	1yr	SURREY	£3750
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SENIOR DATA CONTROLLER — GII	KENT	c£5000
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Plus many more positions also available

DATASCENE RECRUITMENT LTD Sceptre House 169-173 Regent Street London W1R 7FB

01-439 7871 24-hour answer phone

MIDLAND RECRUITMENT FEATURE

Advertisers are reminded that on June 22 Computer Weekly is highlighting career opportunities in the Midlands with a recruitment feature.

To secure space in this important feature:

Contact Alan Escott 021-356 4838 or John Farrar 01-281 8098

Copy deadline. 4 p.m., Friday, June 16

Your chance for Management

ANALYST/PROGRAMMER

BRENTWOOD, ESSEX c. £6,000

Now is the time to start thinking seriously about your future. The year is half gone and still you're meandering along doing the same old job. Well here's your chance to change all that! Our client is a large reinsurance company. They have recently installed a new IBM System 32 at their modern offices in Brentwood, and they are looking for an Analyst/Programmer with good RPG II to head the department, and become responsible for the design and implementation of systems planned for this year. If you have at least 3 years D.P. experience and feel that you can meet the challenge of this demanding position — call now for an immediate interview.

SYSTEMS ANALYSTS

HERTS. £4800-£6000

Why commute? Why not take a local job offering similar salaries, fringe benefits and certainly offering a better quality of life. Our client is a major installation based in rural Hertfordshire. They are looking for additional systems analysts at all levels of experience, ranging from virtual trainees to those who have already made a major contribution to the implementation of at least one major system.
Career prospects are good, fringe benefits attractive, and relocation assistance will be given. We certainly recommend further discussion.

SENIOR ANALYSTS

CITY £7000

Our client is a major U.K. shipping and container transport business. Their substantial investment in Data Processing is based on IBM 370 hardware providing extensive teleprocessing facilities. Business expansion and hardware growth are the contributing factors to their need for additional staff. Applicants should have at least two years' analysis experience coupled with some knowledge of on-line applications. The start salary is attractive and fringe benefits are all you would expect from a company of this stature.

SENIOR BUSINESS ANALYST

LONDON c. £7500

A large software house, shortly moving to new premises in the West One area, is currently seeking a Senior Business Analyst, to join an expanding team of consultants. Applicants, who should be fully conversant with IBM mainframes, will have spent at least 5 years in Data Processing, of which at least 2 years must have been spent in a senior systems position. The ability to liaise at Director level is essential.
This is an ideal opportunity for anyone seeking progression and responsibility.
Remuneration consists of full travelling expenses, BUPA and twice yearly profit sharing scheme.
Interested? Then call now for further details.

West London

SYSTEMS PROGRAMMER c. £7000
APPLICATIONS PROGRAMMER c. £6000

Our clients, one of the largest suppliers of systems software in the world, are looking to recruit the following
SYSTEMS PROGRAMMER, to take the title "Product Specialist," you will become involved in the field support of our client's systems software which will involve regular international travel and a great deal more.
A thorough IBM background is required.
APPLICATIONS PROGRAMMER: you will already have at least 18 months' experience as an IBM Assembler programmer and be willing to "go it alone" in a hectic environment.
You will certainly receive full rewards for your efforts.
Our clients offer excellent conditions of employment, and the above salaries can be exceeded for exceptional applicants.

PETROLEUM

ANALYSTS

TO £8000

Our clients, a world force in the Oil Industry, are seeking to recruit top analysts for their Business Systems Development group, based in Central London.
Applicants must have at least 3 years' systems experience, preferably gained in an IBM environment, and be willing to travel internationally.
Conditions of employment are outstanding.

CHIEF PROGRAMMER

ESSEX c. £7300

A leading manufacturing company based in rural Essex is currently seeking a Chief Programmer to complement their expanding Data Processing Department. At present it comprises an IBM 370 running under DOS/VS, with a large Teleprocessing network. Applicants, who should have around eight years' Data Processing experience, must have a sound knowledge of Cobol and Assembler, together with teleprocessing experience. Project leadership ability is essential. This is an extremely dynamic and responsible position which requires a mature person with a strong desire to progress rapidly within D.P.

PROGRAMMING OPPORTUNITIES

HERTFORDSHIRE £5000-£6000

A number of vacancies have arisen in the Hertfordshire area in particularly Hemel Hempstead for programmers with strong commercial experience on mini or mainframe computers. Applicants should have a good knowledge of COBOL, RPG II or ASSEMBLER and should have spent at least 18 months in a programming environment. The positions offer scope for advancement within an area of Data Processing which is by far the most progressive in the industry. The top range salary quoted is what you can and should expect if you're good enough. What's more, it's what our client will pay. If you think that you are ready for a change for the better, then call now for further details.

CENTRAL LONDON & OVERSEAS TRAVEL

CONSULTANTS

SALARY TO £11,000

Our clients, a major consultancy, are looking for individuals with commercial acumen who can move into a company and decide what is needed. Ideally aged between 28 and 32, you should have a good technical skill in your own discipline and the ability to develop your own general business skill. You will probably have reached a peak in the D.P. business and be ready to trade upon the technical skills for general business skills. Overseas travel is involved from time to time. If you are interested in reaching the top, contact us now, quoting reference GL 150.

PROGRAMMERS

SOFTWARE HOUSE CITY £5500

Our clients, a major and dynamic software house, are seeking to recruit Cobol programmers for a team in the City.
You will have two years' meaningful experience and be keen to move into a Real Time mini computer environment utilising Image data base software.
Conditions of employment are excellent, and include a top salary, profit sharing and travelling expenses.

FORTRAN OR ASSEMBLER PROGRAMMERS

SURREY SALARY TO £6300

An expanding software house, situated near the Sussex border, are looking for programmers to work on commercial/business systems using mini computers. Ideally, you will have a minimum of one year's experience of these types of applications, and if you don't have Fortran, COBOL, PL/1, MUMPS or Coral is also acceptable. In addition, the company is looking for an Assembler programmer with one year's experience on mini-computers to work on a multi-processor system with communications and database. Experience on this sort of work will be well rewarded.

TRAINEES

HORSHAM, SUSSEX SALARY £2,000

If you have A levels and want to get into programming, then this company is the place for you. You will receive training and will eventually write a test program for the company: then, if you pass, and most people do, you become a programmer in a competent professional team and work in superb modern offices. You will also qualify for such benefits as cheap insurance and a mortgage subsidy. Ideally you will live within travelling distance of the offices already as relocation is sometimes a problem.

D.P. RECRUITMENT LTD.,
KENT HOUSE, 87 REGENT STREET, LONDON W1R 7HF
TEL: 01-437 2062/3/4 (24-HOUR ANSAPHONE)

Computing Services Association

A CHANGE IS AS GOOD AS A REST

SYSTEMS ANALYST

To £7470 London

Applicants for this position are required to have a degree or similar professional qualifications, at least 3 years' data processing experience with 1 year analysis and design and a programming background. The company are an ICL installation and are looking for competent and qualified people who can liaise at all levels and manage effectively. For more details phone now quoting reference number.

AOC 1072

ANALYSTS PROGRAMMERS

To £7000 Sussex Coast

If you have had as little as 18 months' COBOL programming or systems experience then our client, who is a world leader in telecommunications, have a lot to offer. Financially, apart from very attractive salaries they are prepared to assist substantially with relocation costs should successful applicants wish to move to this desirable part of the Sussex coastline. A new and interesting challenge plus good promotional prospects are available for professional people who have had experience with commercial on-line systems, stock control or financial applications. No previous experience on IBM equipment is necessary as training will be given. For more details phone now.

AOC 1059

SYSTEMS PROGRAMMER

To £6000 City

Programmers with 2 years' COBOL experience on IBM equipment DOS/VS POWER/VS with CICS and PL1, or programmers with just 2 years' COBOL experience who would like to be trained on the above mentioned equipment, should take this excellent opportunity. Our clients who are a major finance company in the heart of the city, require a systems programmer to help implement and evaluate new software packages, also to maintain current systems. Season ticket, personal and house loans are made available to the successful applicant at discounted rates. Daily meal allowance and other large company benefits are included together with the very attractive salary makes an interesting proposition.

AOC 1038

SYSTEMS CONSULTANT

To £9000 Berkshire

If you are between the ages of 25 and 35 years with a good practical knowledge of data processing and computing techniques, this is an outstanding opportunity for career advancement. Applicants are required to have had several years experience of commercial systems on mini computers plus experience on the design and specification of user systems and a sound knowledge of hardware and software capability. The ability to communicate at all levels, enthusiasm and a sound business acumen is required. The purpose of this position is to verify that business systems have been specified in sufficient detail in order that an efficient computer system can be designed and implemented. For further details phone or send CV to our address quoting reference number.

AOC 1063

PROGRAMMERS — SYSTEMS ANALYSTS

To £5500 Liverpool

for analysts with 18 months' systems experience or to £4800 for programmers with a minimum of 2 years' COBOL programming. A rare chance to develop your career within a professional organisation who place data processing at the front of the company's development plans. Our client is situated in modern premises in the centre of Liverpool with excellent communications by road or rail for outlying residential areas. To get the best available people this company are offering up to 100% relocation costs, good salaries for situation and generous bonus schemes. For more details of what our client has to offer make enquiries now quoting reference number.

AOC 1087

SYSTEMS ANALYST

To £6250 Dagenham

This company who are looking to redesign the majority of current systems to pave the way for a large upgrade in equipment from ICL 1900 or 2950 status. The company are offering attractive fringe benefits plus good opportunities for career advancement, and will welcome applicants with ability and enthusiasm. For more details phone now quoting reference number.

AOC 1017

SYSTEMS ANALYST

To £6750 Southampton

for a systems analyst with 3 years' systems experience to work for a small data processing bureau nicely situated in a desirable area on the south coast. The person will be required to act as a support adviser to the bureau customers backing up a sales person as well as organise a small team of programmers working on customer systems. The bureau have a Univac 9400 running most types of commercial package applications as well as designing and writing systems to suit individual customer requirements. More details available for this position.

AOC 1101

JUNIOR SYSTEMS ANALYST

To £6455 London

If you are a programmer with a minimum of 2 years' COBOL programming experience looking to broaden your computer career as a systems analyst then this is a very viable proposition. Applicants are required to have professional qualifications or a degree and be able to work with minimum supervision. For more details phone now or send written CV to our address quoting reference number.

AOC 1073

PROJECT LEADER

£6300 Slough

Our client is offering an excellent opportunity for a person with 5 years' systems experience plus a good working knowledge of IBM 370 hardware, and software. The successful applicant will be required to lead a team working on TP applications development with mini computer involvement. The company run a non-contributory pension scheme, provide subsidised lunches and operate flexitime working hours. Phone now for more details.

AOC 1111

SYSTEMS PROGRAMMER

To £5000 Middlesex

To qualify for this opportunity to move into systems programming, applicants must have a minimum of 2 years' PLAN programming experience to work on the company's ICL 2903 computer. If you have had the required amount of PLAN programming experience without the systems experience, this position is still very open to you, enquire now for more details, quoting reference number.

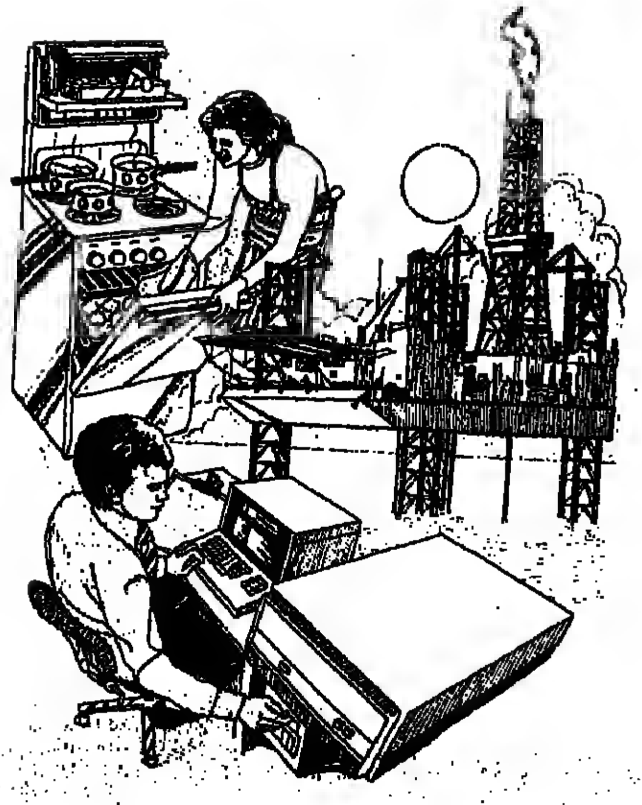
AOC 1120

Gryphon Computer Recruitment
Essex House Cherrydown Basildon Essex
Contact Chris or Olivia on 0268 282155

GRYPHON

GAS GETS ON WITH IT-

Working for a better Britain



North Thames Gas

covering more than 1000 square miles through 24 densely populated Boroughs and employing nearly 13,000 staff providing a service to 1.86 million domestic, commercial and industrial customers.

Customer Service

an area of great importance for ourselves and the consumer. It is into this crucial environment of our operations that we wish to recruit further computer professionals who will help to continually update and improve our systems by joining one of the most exciting projects in the country.

Extensive Distributed Computer Application
based on mini-computers with multi-terminals

Application

We are setting up e computerised customer aervice system based on distributed mini-computer. Will provide on-line customer information through large numbers of terminals.

Hardware

Deta General C330 mini-computers, lerge data storage, printers, several hundred VDUs. These mini-computers will eventually be linked into our extensive mainframe installetion (currently 3 x ICL computers with 200 + remote terminals).

People & Locations

We are seeking experienced Analysts, Programmers, Software + Operations Specialists (male end female) to work ot one of two locations in West London – either our Development Centre in Acton or the Regional Computer Centre in Staines.

Training

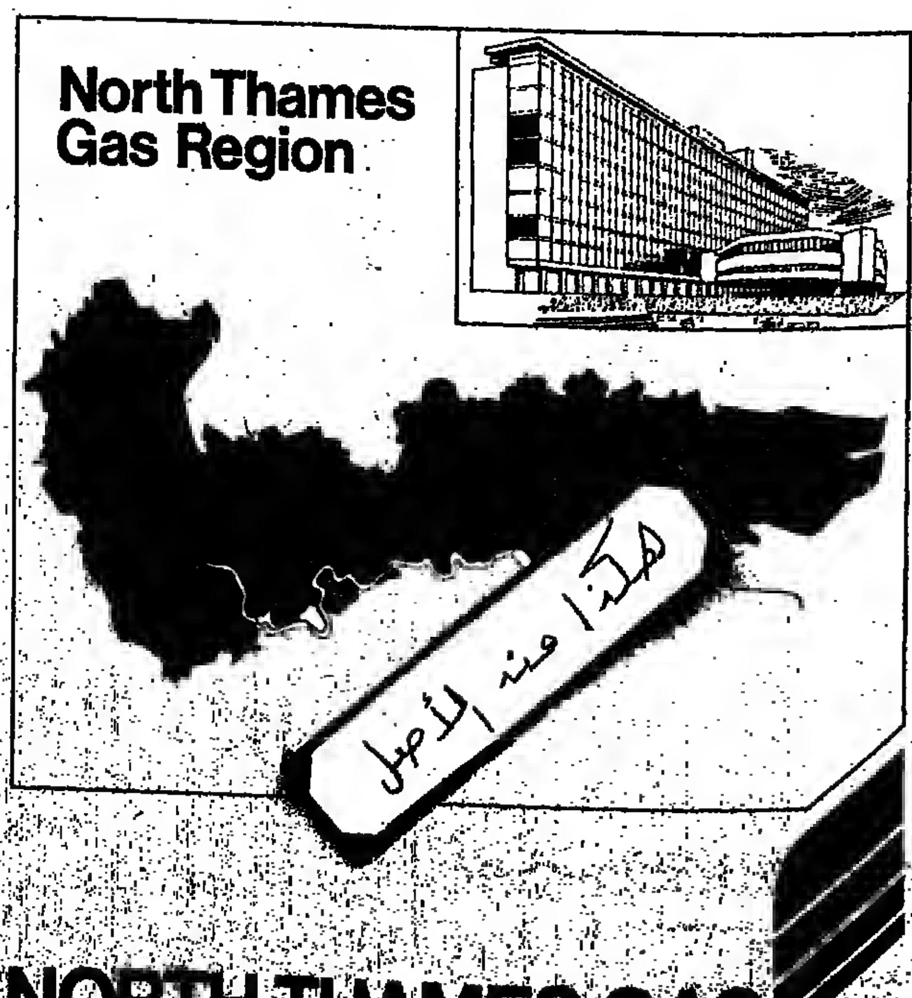
We consider our training and development epprosch for computer staff to be among the best anywhere – esk any of our present ateff.

Prospects

According to your age and experience, the starting salary will be in the range £4500-£6000 which includes Metropolitan Weighting and pay policy supplements. We offet en excellent benefits package and long term career prospects are likely to be first rete.

Action

Finding our ebout our vacancies is just a telephone call away. Ring Staines 61666 and ask for Peter Woodhart, our Computer Manager in charge of the Staines installation. Or else write briefly (making an application form unnecessary at this stage), to Mike Hinds, North Thames Gas, North Thames House, London Road, Staines, Middx. TW18 4AE, quoting reference B/9000.



NORTH THAMES GAS

Computer Operator

A Progressive Career in Bracknell

We operate a 2030A under OS/2000 on a 2-shift system, using disc, tape and file output from a Redifon Seecheck system.

Owing to the promotion of an Operator to Programmer, we are seeking someone with at least a year's relevant Honeywell operating experience to join our team providing a service to the Clark Eaton Group – leading flat glass merchants, glazing contractors and glass processors.

The benefits are those normally associated with a progressive company including relocation assistance where appropriate.

Find out more about them and the salary provided by calling Vincent Murphy, Personnel Manager, on Bracknell (0344) 24733 or write to him at James Clark & Eaton Limitad, PO Box 19, Southarn Induatriel Araa, Bracknell, Barkshira RG12 4UU.

CLARK

Operators— Do you know George?

Bestobell Oata Systems Limited, the central systems development end bureau service of the Bestobell Group, has the following vacancies es a result of company growth and internal promotion.

Senior Computer Operator around £4,000

Responsible for the dey to dey operation and supervision of the computer room, to ensure the efficient operation of the computer end its ancillary equipment.

2 to 3 yeers operations experience required, including a reesonable spell in e supervisory role, covering disc end tape based systems end the relevant software. A knowledge of ICL 2903 or 1900 range operating under Executive 1/2 or George 2 is essential.

Computer Operator around £3,500

Someone with e similer background and experience to the Senior Operator but who does not need to heve worked es a shift leeder. A generous shift allowance is paid for e 2 shift system end e profit linked bonus scheme provides e supplement to your annual selary. You are intitled to 4 weeks ennual holidey end you would work in modern premises in Slough (conveniently neer the M4)

For further information please telephone Glorie Ezard, on Slough 33477 or write to her at Bestobell Oata Systems Limited, Stoke House, Stoke Poges, Slough, Berkshire.

Bestobell
an international group

Anglian Water Authority

CORPORATE PLANNING

To £5,000 (NJC Grade 6)
★ Plus New Awerd from July 1978 ★

Do you understand computers?
Can you analyse situations and make computers work for you?
Can you help us to analyse the effects and benefits of our Capital Development Programme?

The Anglian Water Authority invest £300M every 5 years on the water services in an area covering one fifth of England.

The investment data base is currently held on a DEC PDP 10 but will shortly be transferred to the Authority's own Honeywell 66/10.

If you have a flair for problem solving and want to join a small professional team of Corporate Planners, contact us but only if you can pull your weight.

We are looking for one good Programmer with at least 3 years at the senior level who wents to broaden his/her scope. Previous experience of Corporate Planning is not necessary -- but you should understand computers and how to make them do the work. Programming experience in FORTRAN is an advantage as would experience with Honeywell 66/10 on Dec PDP 10 mechine, but we are prepared to train a person with the right attitude and proven ability.

If you are interested or went to know more about this opportunity, why not call Peter Cowle, Huntingdon (0480) 56181 Ext. 263 for information and an application form.

The closing date for applications is 22nd June, 1978 and should be sent to

ANGLIAN WATER AUTHORITY
Diploma House, Grammar School Walk
Huntingdon, Cambs. PE18 6NL

£neg — CONTRACT RPG2 — Holland
Immediate 3 month + vacancy for Amsterdam. Must have IBM S.3 experience and at least 2 years RPG2.

c£7K — PROJECT LEADER — N. Herts
Good Analyst/Programmer to take over development of accounting system. Well educated with 4 years + experience preferably with 1900/2900 and COBOL (GEORGE 2)

c£5.5K — ANALYST/PROG — Middx.
General commercial experience on any small/medium equipment preferably IBM and 3 years prog/or systems. Installation is IBM 370/138.

Many more unadvertised positions

COMPUTECH SYSTEMS & PERSONNEL
168 Finchley Road, London, NW3 6HP

COMPUTECH 01-794 0202

The City University Business School

Courses in Systems Analysis 1978-79

Diploma in Systems Analysis

This is a full time one academic year course for data processing professionals who wish to broaden and improve their practical experience and theoretical knowledge of systems analysis. Candidates with suitable experience need not have a first degree. It may be possible for successful students to convert the Diploma to an MSc by means of a part time project and dissertation.

MSc in Business Systems Analysis and Design

This is a full time one calendar year course for graduates (or other suitably qualified candidates) with data processing experience. The course provides a comprehensive academic and professional grounding in systems analysis and design which combines the practical demands of work in this field with the theoretical knowledge required.

Further information on both these courses is available on request from Admissions Secretary (Business Systems) Room No 418, The City University Business School, 73 Goswell Road, London EC1M 7BS. Tel 01 253 4399 Ext 577 or 878.
Application should be made as soon as possible but in any case not later than 30 June 1978.

TOPS GRANTS MAY BE AVAILABLE FOR SUITABLE MSc STUDENTS

LONDON BOROUGH OF HARINGEY
COMPREHENSIVE HOUSING SERVICE

COMPUTER OFFICER

UNIVERSITY OF ESSEX
COMPUTER OFFICER
In the department of Computer Science Computing Service

Applications are invited for the post of Computer Officer (Grade 1A) (salary scale £3,333-£5,627 p.a. under review). Applicants should have interests in non-sequential systems: interests in the establishment and development of computer networks would be an advantage. Previous experience in these areas, whilst desirable, is not essential; familiarity with the concepts of low-level programming would be useful.

The successful applicant will join an established Programming Group, which has responsibility for all aspects of software maintenance and development on the University's Service machine. This is a DEC system — 10/70, providing an extensive Timesharing and Batch service.

Applications (six copies) including a curriculum vitae and the names and addresses of two referees, should reach the Registrar (AG/21/CW) University of Essex, Wivenhoe Park, Colchester CO4 3SQ, from whom further particulars may be obtained by July 7th, 1978.

THE OPEN UNIVERSITY
DATA PROCESSING DIVISION

OPERATIONS PLANNING
SALARY UP TO £6,000

The Open University founded in 1965, is now a major force in higher education. It has pioneered new forms of under-graduate and post-experience education, and its future plans include developments requiring a similar level of innovation.

Data Processing has been fundamental to the growth of the University and is scheduled to play a major part in its continuing development.

The Operations Planning Section plays a vital role in representing Data Centre interests in the early development of systems, in facilitating the hand-over of newly developed systems for live operation and in supporting accepted systems on a continuing basis.

Applications are invited from persons with knowledge of Univac 1100 and who have some experience of programming and computer system design. Career development prospects are good and in addition we offer: Good holiday provision; excellent sports and social facilities, and rural location with houses available to rent or to purchase at reasonable prices. (Removal expenses are payable).

Application forms and further particulars are available, by postcard request please, from: The Recruitment Office (OP2), The Open University, P.O. Box 75, Walton Hall, Milton Keynes, MK7 6AL or by telephone from Milton Keynes 63404 or 63535 (24 hours answering service).

Closing date for applications 29th June 1978.

CONTRACT PROGRAMMERS
Experienced in one or more of the following?
★ COBOL ★ PL/1 ★ ASSEMBLER ★ CICS ★ BASIC ★
★ ICL ★ IBM ★ MINIS ★ GII ★ GIII ★ DOS ★ OS ★
Then call us now for your next contract at up to £250 p.w.
Phone Mike Doran on 01-437 2242
MACROLOGIC MANAGEMENT SERVICES LIMITED

THE SALES BIT

Objections and rebuttals PART II

IN lost week's column we were discussing some of the disciplines which salesmen might adopt, related to the handling of queotions within the sales negotiation. The main points were: 1 — Answer all objectiona and questions truthfully but qualify their relevance; 2 — Don't leave queetions unanswered; 3 — Alweys listen carefully and never interrupt.

Let's consider e couple of more basic rules:

The salesman should never argue with the buyer or tell him he is wrong. Whatever the circumstonces, an unempethetic atmosphere is almost certain to result. This is true whether the buyer is actually wrong or not. Full-frontal contradictions seldom work to a salesman's advantege.

Having said that, it is often important for a salesman to make his point without upsetting the applicant. Here are eome useful prefixes which con take away the initial impact of a otatement which might be at odds with the buyer's own opinion.

I agree but . . .
I'm surprised, my impreesion is . . .
I didn't realise that, I always thought that . . .
I agree that is usually the case, but in this porticular inotence . . .
I always used to think that, but recently I've discovered . . .

Then the sulesman mokes his point. It just makes the hlow a littlu oolter.

Sometimes an objection needs to be qualified, so the saleoman may know if it is reel or just a diversion.

This is where the "but if" test is useful.

Objection:—We don't need computers. Our manual system gives us all the information we need.

Rebuttal:—I am sure your present syetem fulfils its function admirably. But if I could prove by way of existing users that there are many substantial finencial and management control benefits which can be brought about by our special computing approach to your type of problem, it would be an asset to your company, wouldn't it?

Objection:—Your system is too expensive.

Rebuttal:—It is certainly not cheap, one tends to get what one pays for. But if I can prove that our cost/performance is st least equal to that of our competitors, will you give us the business?

You will notice an effective rebuttol converts an objection into o "trial-close", or at least attempts to gain commitment from the buyer. That is a very important point to remember, and one of the best times in a negotiation to ask for the order is on successfully overcoming on objection.

Objaction:—I'd like to, but I don't feel I know you well enough.

Rebuttal:—I know we've only just met, but if I tell you the story of my life, then will you?

TRADER

How computing will affect management

● From Page 23

development, the lack of precise definition of jobs and tasks can produce personal embiguity which many people find uneccept-able.

With the insight this provides the more participetive views of Anshen would seem to be favoured. If we cen be sure of anything in the future it is that the rete of ohange we will experience will be more rapid than ever before. A move towards a more Theory Y style will be necessary to enoble us to cope. Our creeking bureeucraciea must change themselves. It is to be expected, therefore, thet the deta processing profession should be strongly Theory Y in orientation.

Thia, however, does not seem to be the case. If anything the definition of tasks and jobs is more precise than in most aresa of manegement. Notwithstanding the highly desireble improvement in intelligibility of coding gained, the highly authoritarian management controls which seem to be a major appeel of structured programming are a metter for concern.

The resulta of e study of the management style of data procesaing menagers presented at an IFIP conference in 1974 by Enid Mumford and Bo Hedberg give a further cause for concern. Comparing British and Swedish managers, the British manogers were found to be more Theory X in style compared with their Swedish counterparts. This reflects in no way on their technical competence. But it may indicate a relative leck of ebility to put sound innovation into practice.

Isn't thet something we've heerd before?

On the move in Manchester

THE Manchester office of Computer Machinery Co haa been moved to St James' House, Pendelton Way, Salford, Manchester, M6 5JA. The telephone number remeins 061-737 6023.

Puzzle answer

The smallest set is 44-117-240, giving the perfect squares 125^2, 244^2 and 207^2. The next lorgest set is 88-234-480, and the next 85-132-720.

The sign of a better job.

You already know the Gemini name as the largest software group in Europe. Now we're the name to come to if you're looking for outstanding job opportunities — anywhere in the industry at any level.

How does our service differ from other recruitment agencies?

You'll be dealing with consultants who have an in-depth knowledge and experience and are therefore able to see things from your point of view because we're in the industry ourselves.

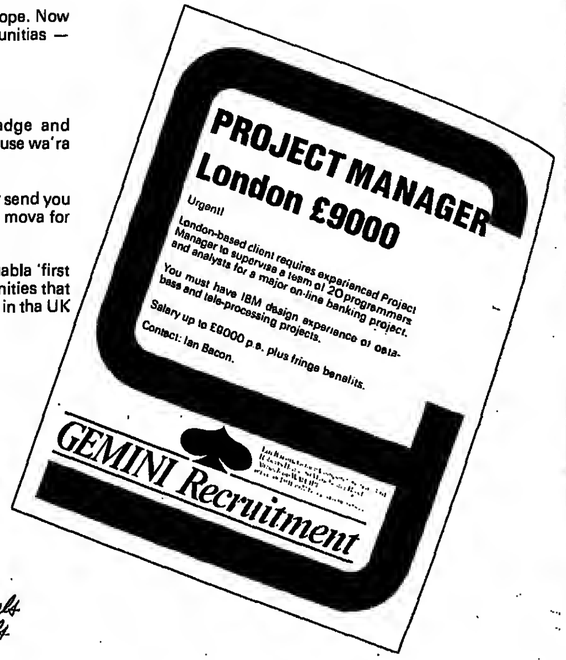
We're better able to make an assessment of your true worth. We'll never send you to an interview unless we feel you're right for the job . . . and it's the right move for your future.

You'll be advised of jobs that are not advertised — giving you that invaluable 'first crack' at the job. Where we think fit, we'll also recommend career opportunities that may not have occurred to you before. Interviews can be arranged anywhere in the UK or Europe.

How do you contact us?

We'll be appearing regularly in this position (inside back page) from now on. Just look for the advertisement with the 'G' border.

So now you know where to find the better jobs . . . on this page . . . at Gemini Recruitment.



Gemini Computer Systems Ltd.
Roberts House, 80 Manchester Road, Altrincham
WA14 4PL
Tel: 061 941 1922

Run by Professionals -for Professionals

SENIOR SYSTEMS ANALYST
West End — £6000 to £7300

An opportunity has arisen for an experienced and articulate Systems Analyst to progress into a more demanding and responsible position, leading and co-ordinating the work of a team of three other analysts.
The installation comprises an ICL 1903 machine running under GEORGE II, and an extensive Real Time system utilising DRIVER and COMMS MANAGER. Experience in any of these areas would be highly desirable, as would a programming background in either COBOL or PLAN.
You should have at least 4 years total DP experience, 2 years of which should be in Systems Analysis, and during this time you ought to have installed 2 major systems. The work will cover many different projects and will involve a wide area of systems and applications.

Reference JC 23/1

COBOL PROGRAMMERS
City — £4000–£5000 plus Mortgage

A major financial organisation with an expanding ICL 2900 system is seeking several programmers for their city-based installation.
These positions will be ideal for people with at least one year's commercial experience gained preferably on ICL equipment.
The company offers a high starting salary and an excellent benefits package including Season Ticket Loans, Flextime and a Mortgage Subsidy Scheme.

Reference JC23/2

PL1 PROGRAMMERS
City — £5000 plus mortgage

A major financial organisation needs programmers with 2 years good commercial experience to join their expanding DP department in the City.
They currently operate a twin IBM 370/138 system, running under DOS/VS, and have a comprehensive communications network; so any knowledge of CICS would also be an advantage.
In addition to a competitive starting salary and excellent career prospects, the company offers interest-free Season Ticket Loans, free Life Insurance an Annual Bonus scheme, and a 3% Mortgage.

Reference JC 23/5

SYSTEMS PROGRAMMER
City — Negotiable

A large and highly respected financial institution is seeking a capable and imaginative OS/VS Systems Programmer to work in their City based installation. They are using two IBM machines — a 370/148 and a 370/158, running under OS/VS1 with VM/CMS.
The ideal candidate would have a general programming background preferably in ASSEMBLER or PL1, with a minimum of around 18 months in OS or OS/VS Systems Programming. Knowledge of IBM 370 Hardware and Software fundamentals is desirable as is any experience of performance measurement and estimation techniques.
Salary will be totally dependant upon ability and experience, and will not prove a limiting factor for the right person.

Reference JC23/4

FORTRAN PROGRAMMERS
London — £4000–£6500

A major engineering company located just south of the river near London Bridge Station requires an experienced Fortran programmer. The suitable applicant should have a degree in Applied Mathematics or Engineering and at least two years experience in Fortran, preferably on IBM equipment.
Liaising with users and other programmers you would gain experience in Scientific Applicators, Strassing, Thermo Dynamics etc and could expect good career progression and an above average salary.

Reference PG 23/3

COMMUNICATIONS PROGRAMMERS
Hertfordshire & North Kent — £4000–£8000

A market leader in computer based communications equipment have a number of opportunities for engineers and programmers in the following areas.

Real Time — Distributive Processing
Software Engineering — Compiler Software
Micro Processors — Data Communications

Experience in any of the above, possibly coupled with a degree, would lead to an excellent salary together with a generous benefit package which includes Flextime, 24 days Holiday, L.V.'s, Generous relocation expenses and Subsidised Company products.

Reference PG 23/6

Datascene Recruitment Ltd
Sceptre House
169-173 Regent Street
London W1R 7FB

datascene 01-439 7871
24hour answer phone

Ascii through the Logic Gate

An epic in 32K words, by Richard Forsyth

Block 2 (A Mental Block)

Hex has been taken prisoner at Sprocket's Hole and forced at gunpoint to switch off Ascii. Now he awaits his fate with resignation.

Sheriff Sprocket accepted the pipe from his partner and took a couple of deep breaths. A look of satisfaction settled on his features. Hex averted his eyes and sat with his head cast down, his mind so empty of ideas for escape it might have been running the null job. He gazed at the floorboards in silence, losing all track of time.

Suddenly he was aware of a monotonous rhythmic drone. He raised his eyes to look at the androids. There was Sprocket, slumped deep in the rocking chair with the rifle still cradled in his arms, fast asleep and snoring like an old walrus. Bill Bootstrap had actually slid off the bench and knelt against the table, his chin propped up by it, with a beatific smile on his face. The clay pipe had fallen from his lips and splintered into pieces on the floor. Beside it lay his shotgun.

At that moment, as Hex gaped in astonishment at this golden opportunity for deliverance, the door creaked gently open and Cleo crept into the room. In spite of his amazement, Hex was the first to speak.

"You risked your life," he said.

"So did you when you dragged me clear of the mob on the reservation," she answered, "and by coming here."

"How did you do it?"

"I knew when I overheard the Network news that they would be expecting you, so I changed the hush coding algorithm in Bootstrap's n-dimensional shape vector. He got something stronger than he bargained for. Now he's gone into a hibernate state." She broke off as Davy Sprocket's body was rocked by a particularly convulsive snore. "Better get packing," she urged Hex, "we can't sit about joking all night."

"But it will take hours to power up Ascii safely."

"By which time Kludge and his inquisitors will be here. They're due early in the morning."

"Yes, but if I just switch the juice on again he might have a head crash, or worse."

"If you don't want to risk it we'll have to carry him."

Hex looked down at Ascii's prone body, weighing the best part of a hundred kilograms, and scratched his chin. "I've had an idea," he said after a moment's thought. "Is there any wire in this godforsaken hole?"

"Well, there's a 25-pin cable leading from the teletype."

"Fine! This will only take a few minutes."

Hex went over to Bill Bootstrap and gingerly extracted from his limp hand the leather pouch containing all his worldly possessions which the android had confiscated. In it were the blueprint for an anti-data "block noise" generator and the 40-pin microprocessor that Null had bequeathed to him. At the bottom was his soldering iron. He took it out and moved over to the archaic teletype.

Cleo watched in puzzlement and some impatience as he ripped out the data lead and brought it over to Ascii. "What's the idea?" she inquired.

"It's safe enough to turn on his motors," explained Hex, "but I'm worried about his logic circuits. I didn't have time to go through the proper shut-down procedures, you see, and his memory may have been scrambled. So I'm going to drive him by remote control. Then when we have time I can check all his circuits and restart him in the normal way."

"You mean you're going to rig him up as a peripheral unit?" she asked.

"Exactly. I wonder if you could give me a hand," Hex said holding out the connector. "If you look on the back of my head you'll see a socket marked 'Auxiliary I/O port'. Plug it in there."

Cleo plugged it in and Hex finished soldering the connection on Ascii. "Right," he said, "now before we try it out, you collect their weapons." Cleo carefully prised the rifle from under Sprocket's forearm, then picked up Bootstrap's shotgun.

"Okay, stand clear," advised Hex: "here we go!"

Cleo edged towards the door. Hex touched the live wire to Ascii's batteries. For a fraction of a second nothing happened. Then a red warning indicator flashed on Ascii's nose and the hut was filled with the screech of a siren.

"Motherboard!" swore Hex, throwing open the lid between Ascii's ears. His hand dived in and flicked a switch. There was peace once more. "I forgot to switch off the audio alarm," he apologised to Cleo.

"So I noticed," she replied.

Throughout it all Sprocket's regular snoring had continued uninterrupted. "It seemed louder than it was," added Hex in self-justification. "Anyway he's ready to roll now. Could you please open the door for us."

Cleo pulled it open and made her exit into the night. Then Ascii jerked into motion under Hex's guidance and the pair of them, linked by two yards of wire, lurched drunkenly towards the door. Mercifully, they missed all the obstacles in their path.

When they rejoined Cleo outside Hex turned to shut the door behind them, then paused as if he had forgotten something.

"Wait a minute," he said, and pulled out the data cord again. Before Cleo could voice her objections he had re-entered the hut and strode over to the now-defunct terminal in the corner. He switched it off-line and typed one word.

BYE.

Would Cleo be better off without her 'rescuers'? Read next week's issue for her own opinions on the subject.

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The quiet frequency converter

QUIETNESS of operation is one of the main features of a frequency converter now available to users of big computers like the IBM 370/158, 3033, Amdahl 470 and Univac 1100/80. Called the Super Silent Block, it is built by Anton Piller (UK) Ltd and converts power from mains frequency to 441 Hz.

The Super Silent Block comes with an asynchronous motor and an AC generator mounted on the same shaft. This is housed, together with the associated control equipment in a sound proof cabinet which reduces the noise level to 56 decibels (dB) measured at one metre. Anton Piller points out that this meets the NR-55 standard.

The Super Silent Block is supplied as a 75 kilowatt unit, but variations are available for different voltage and frequency requirements.

The input voltage is 380 volts or 415 volts at 50 Hz and 440 volts at 60 Hz, and the respective revolutions per minute at full load are 2,940 and 3,557.

Using a paralleling unit also supplied by Anton Piller, up to eight converters can operate in parallel for greater reliability. Anton Piller added that there must be one more converter than the number of computers so two computers would require three converters.

The time between full failure of the Super Silent Block is 150,000 hours and an efficiency of 85% are quoted. The unit measures 2.20m x 1.70m x 1.00m.

Anton Piller (UK) Ltd, Cleve Lane, Cirencester, Glos. Tel: Cirencester 61272.

Cleaning system

A magnetic disc cartridge cleaner is one of the products being sold by a new marketing company, International Data Automation Ltd, of Virginia Water, Surrey, which is offering European sales and support facilities to companies manufacturing novel computer products.

The cartridge cleaner is the Model 300 from US firm, Innovative Computer Products Corp. It is available in two versions, one for handling IBM 3440 type top loading cartridges and the other for 2315 type front loading cartridges. It can clean both sides of a cartridge in three minutes.

International Data Automation Ltd (CW), 33 Abbots Drive, Virginia Water, GU25 4AH Tel. Wentworth (09904) 2838.

Bigger busloads

USERS of Digital Equipment PDP-11 computers can now have 19 additional busloads and 50 additional feet of bus length if they use Re-bus. This comes in the form of a dual width board which is installed in the same pair of connectors as the Unibus extension cable.

Re-bus provides a bus repeating function without requiring the space of an entire system unit. No software changes are needed and the bus cycle time is unaffected for devices on the same side as the Re-bus. For devices on the outboard side it is increased by a maximum of 250 nanoseconds.

Re-bus is available for PDP-11/04, 11/05, 11/10, 11/34, 11/35, 11/40, 11/45 and 11/70 machines and costs £495 from Sintrom Electronics Ltd.

Sintrom Electronics Ltd (CW), 14 Arkwright Road, Reading, RG2 0LS. Tel: 0734 55444.

9,600 bps modem

THE Interdriver LD98A modem from Modular Technology gives telecommunications users transmission speeds of 9,600 bits per second over distances of up to 10 kilometres and 110 bps for up to 20 km.

The company says this performance makes the Interdriver LD98A more suitable for in-house communications of short distances.

The modem, developed in UK, is powered from the mains with a standard CCITT interface on a 23-pin "D" type socket for full or half duplex asynchronous and synchronous transmission over DC continuous unloaded lines.

Modular Technology (CW), PO Box 117, Watford, WD1 4PD. Tel: 01-421 0654.

System builder's desk

PEOPLE building small computer and peripherals from a variety of firms could be interested in a desk designed by the Birmingham firm Wolsey Degree. The instrument cabinet houses standard 19-inch racks and is 32 inches deep and 14 panel units high. The desk top is 48 inches long.

Wolsey Degree Ltd (CW), PO Box 138, Regal Street, Birmingham, B4 7BD. Tel: 021 359 3044.

Why vacant memory slots aren't needed

VACANT memory slots are not needed for the 501 range of add-on memories offered to Digital Equipment PDP-11 users by Sonsion Ltd. Instead, the 501 memory can operate a small peripheral control and of quad or hex height. It is compatible with the DEC PDP-11 memory management unit and can be supplied with a capacity of 4K, 8K, 12K and 16K words of 18-bits. It can easily be upgraded from 4K to 16K, according to Sension. The 501 memories use existing Unibus power lines and come with on board control and refresh circuitry. They can be used with existing core memory.

The components used with 501 memories are 4K dynamic MOS RAM chips with an average access time of 570 nanoseconds. Typical cycle times are 505 nanosecond refresh, 880 nanosecond write and 705 nanosecond read.

With +15 volts power supply the DC supply requirement varies between 618 and 625 millimaps while operating and between five and 15 millimaps while quiescent. With +5 volts the figures are 865 to 715 millimaps quiescent and 940 to 865 millimaps in operation.

Sension Ltd (CW), Denton Drive, Northwich, CW9 7LU. Tel. Northwich (0606) 44321.

Automatic test system

AN AUTOMATIC test system that signals when the operator has moved off the correct track when tracing a fault has been introduced by DenRad. Called the 2220 G Bug Hound, it is a portable unit with a current tracing probe that has two light emitting diodes at the tip.

When the probe moves off the correct track to the left the left LED goes on and an audible tone is heard. When the probe moves off to the right the other LED lights up and a different tone is heard. Both LEDs and tones stay off when the probe is directly over the track.

DenRad said that this enables the probe to stay on the right track even when several tracks are close together and it greatly simplifies the process of physically locating a short.

DenRad Ltd (CW), Bourne End, Buckinghamshire. Tel: Bourne End (06285) 28611.

Air cleaner

AN air cleaner suitable for use in computer rooms is now available from RAB Products. Called the Merlin Mark 3, it measures 17 x 13 x 19 inches, weighs nine kilograms and can be mounted on a wall or can be free standing.

RAB Products (CW), 2 Simpsons Road, Ham, Surrey. Tel: 01-948 1021.

Increasing throughput

SYSTEM throughput on Digital Equipment PDP-11 computers can be increased by an average of 22% using the 920/981 cache buffer from Fabri-Tek.

The 920/981 uses bipolar semiconductor technology and has a capacity of 2048 bytes and an access time of 800 nanoseconds. It buffers the entire main memory.

The 920/981 comes in the mm form of two printed circuit cards in a module measuring 8.25 x 8.2 x 2 inches and this can be installed in a few minutes with no hardware or software modifications.

The cache replaces the M981 Unibus Terminator module in the PDP-11/35 and 11/40 and the Unibus Jumper Module in the PDP-11/34 and other PDP-11 processors.

Fabri-Tek Computer Components (CW), 50-52 Moorbridge Road, Maidenhead, SL6 8BN. Tel: 0628 37321.

Disc exerciser

USERS OF IBM type 2315-5440 disc drives manufactured by any one of a number of companies could be interested in the WL Model DX-500 disc exerciser from Wilson Laboratories Inc.

The DX-500 comes with a series of switch selectable pre-programmed exercises. These can isolate and identify data errors, format errors and seek errors in linked systems with between one and four drives. If any error is encountered the DX-500 can stop on indicate the error and carry on running.

Wilson Laboratories Inc (CW), 2,838-D East Fender Avenue, Fullerton, California 92631, USA. Tel: (0101-714) 992 0410.

Data recorder

UP to 85,000 characters can be recorded on a magnetic tape cassette using the Porta 200 hand held data recorder from the US firm, Technran Industries.

The Porta 200 comes with a 16-key pad, a display and a cassette drive. Data is displayed for verification as it is entered and recorded.

The Porta 200 is battery powered and can operate for about four days between charges, according to Technran.

It weighs three pounds and costs $825 (£460), including a battery and charger. Application areas seen for the Porta 200 by Technran include warehousing and retailing.

Technran Industries Inc (CW), 200 Commerce Drive, Rochester, New York, 14625, USA. Tel: 334 9640.

Vacuum tubes

DIGITAL Instruments are seen as one application area for the Itron range of vacuum phosphorescent tubes from ITT Components Services. They can display up to 40 digits and alpha-numeric characters.

ITT explains that an Itron tube consists of three electrodes, namely a cathode, a grid and a phosphor coated anode. The latter is divided into seven or more independent segments one for each character. When activated they glow with a blue-green colour. Between two and 40 digits can be displayed at a time.

Other applications areas for the Itron include calculators, cash registers and weighing scales.

ITT Components Services (CW), West Road, Harlow, Essex. Tel: 0279 33331.